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"DEFIANCE"

High-Grade

Wood-Working

Machinery

for making

Automobile

Wheels

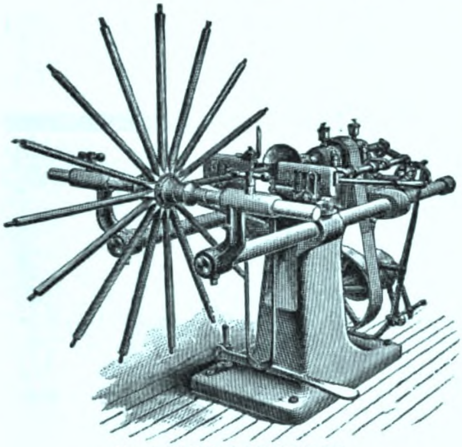
and

Bodies

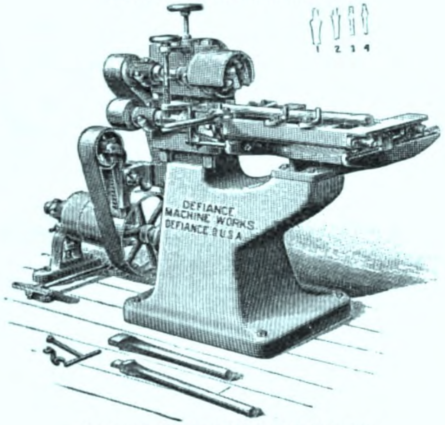
Complete Equipments of the Most Modern Tools

Invented and built by

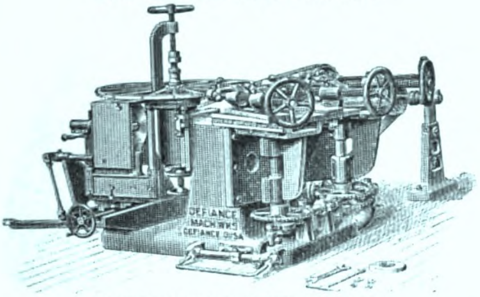
THE DEFIANCE
MACHINE WORKS
DEFIANCE, OHIO



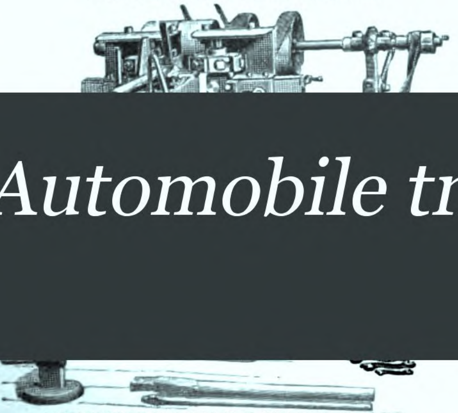
No. 1 WHEEL TENONER


1 2 3 4
DEFIANCE MACHINE WORKS DEFIANCE O.U.S.A.

SPOKE MITERING MACHINE


DEFIANCE MACH WKS DEFIANCE O.USA

AUTOMATIC WHEEL RIMMER



AUTOMATIC DOUBLE SPOKE FACER

36" BAND SAW

CE
ORKS
O.USA

AUTOMOBILE SPOKE LATHE

Automobile trade journal

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Michigan
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ARTES SCIENTIA VERITAS

UYERS' GUIDE SPECIAL Price, 5
X, No. 7 PHILADELPHIA AND NEW YORK JANUARY 1,

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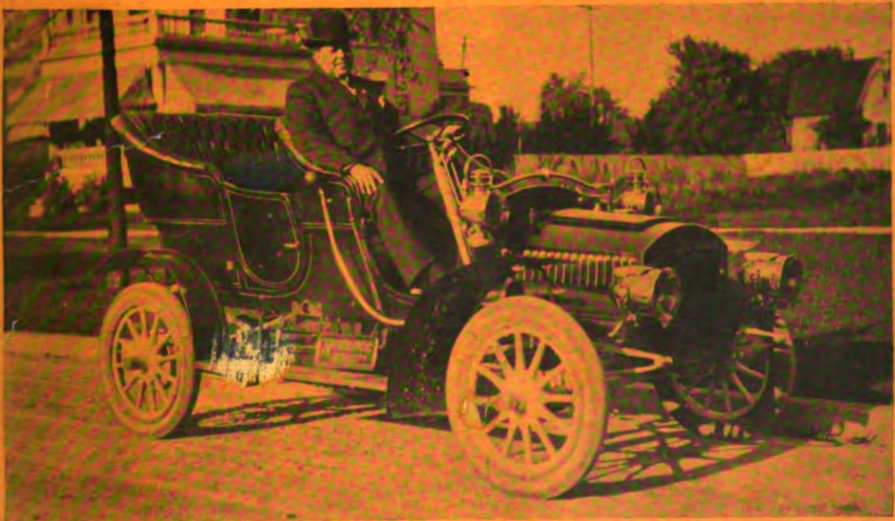
CYCLE AND AUTOMOBILE TRADE JOURNAL

Reliance
DETROIT
TRUCKS TOURING CARS



The Price, $1250 **The Horse Power, 22**

A BIG, ROOMY, FIVE PASSENGER TOURING CAR, SIMPLE IN OPERATION, WITH SPEED AND EASE OF CONTROL UNSURPASSED. 1906 MODELS READY FOR DELIVERY. WRITE FOR CATALOG. AGENTS WANTED,

RELIANCE MOTOR CAR COMPANY
SALES OFFICE, 23 FORT STREET, DETROIT, MICH.

GENERAL INDEX.

INDEXES
Advertisers' Index 603-605
Buyers' Guide Index........ 593-594
Reading Matter, Classified Index........ 594

LEADING ARTICLES.

America Makes Finest Castings, by F. C. Fromm........ 115
Auburn 1906 Cars 96
Baker 1906 Electric Cars, by W. J. Grube........ 143
Berkshire 1906 Cars, by E. S. Foljambe, B. S........ 236a
Blomstrom Motor Co.'s 1906 Queen Cars, by Hugh Dolnar........ 98
Cleveland 1906 Cars, by W. J. Grube........ 144
Connecticut Spark Coils, by E. S. Foljambe, B.S........ 249
Crawford 1906 5-passenger Car........ 229
Dorris 4-cylinder Car........ 206
Duquesne 1906 Air-cooled Car, by W. J. Grube........ 214
Editorials 73
Gaeth 1906 4-cylinder Cars, by W. J. Grube........ 174
Gale 1906 Touring Car, by Hugh Dolnar........ 247
Haynes 1906 4-cylinder Cars........ 239a
Iroquois 4-cylinder Gasoline Motor Stage, by W. J. Grube........ 219
Jackson 1906 2 and 4-cylinder Cars, by Hugh Dolnar........ 233
Lambert 1906 2 and 4-cylinder Friction Drive Cars, by Hugh Dolnar 225
Lane 1906 Steam Touring Car........ 231a
Maxwell-Briscoe Motor Co.'s Progress and 1906 Line........ 246
Mechanical and Technical Department........ 123
Moline 1906 Models, by Hugh Dolnar........ 89
Motor Boat Department 385
National 1906 4 and 6-cylinder Cars, by Hugh Dolnar........ 230a
Pope-Toledo Type XII........ 138
Premier Air-cooled 1906 Cars, by Hugh Dolnar........ 185
Thomas 50 H. P. 1906 Car, by W. J. Grube........ 109
Torbensen 3 and 6-cylinder Air-cooled Engines........ 166
Walker Motor Co.'s Runabout........ 103
Welch 1906 50 H. P. Car, by Hugh Dolnar........ 152

Diamond

Side Wire Solid Tires

Are a Certainty

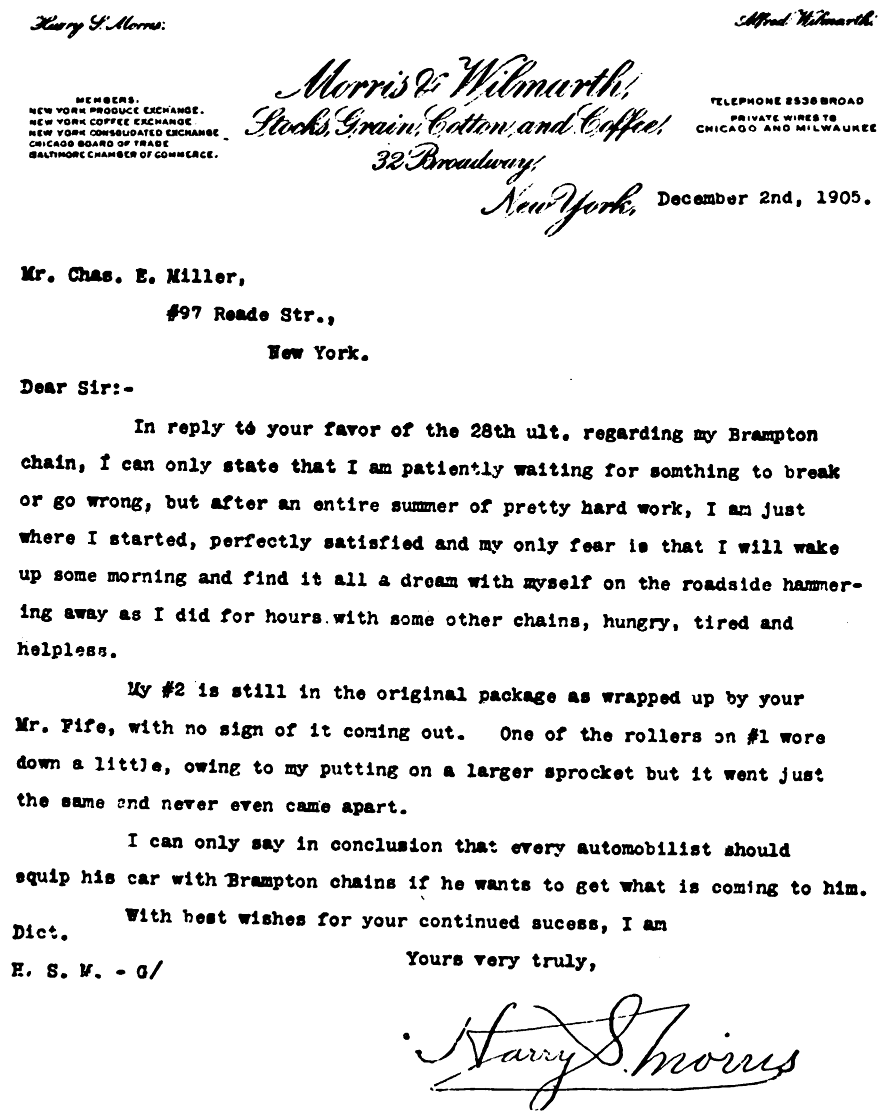
Their Record is a
Diamond Record

Why Take a Chance?

Interesting facts as to weight and sizes sent on request

The Diamond Rubber Co., Akron, Ohio

The Largest Automobile Supply House in America



Harry S. Morris: Alfred Wilmarth.

Morris & Wilmarth,
Stocks, Grain, Cotton, and Coffee,
32 Broadway,
New York,

MEMBERS.
NEW YORK PRODUCE EXCHANGE.
NEW YORK COFFEE EXCHANGE
NEW YORK CONSOLIDATED EXCHANGE
CHICAGO BOARD OF TRADE
BALTIMORE CHAMBER OF COMMERCE.

TELEPHONE 2538 BROAD
PRIVATE WIRES TO
CHICAGO AND MILWAUKEE

December 2nd, 1905.

Mr. Chas. E. Miller,
#97 Reade Str.,
New York.

Dear Sir:-

In reply to your favor of the 28th ult. regarding my Brampton chain, I can only state that I am patiently waiting for somthing to break or go wrong, but after an entire summer of pretty hard work, I am just where I started, perfectly satisfied and my only fear is that I will wake up some morning and find it all a dream with myself on the roadside hammering away as I did for hours with some other chains, hungry, tired and helpless.

My #2 is still in the original package as wrapped up by your Mr. Pife, with no sign of it coming out. One of the rollers on #1 wore down a little, owing to my putting on a larger sprocket but it went just the same and never even came apart.

I can only say in conclusion that every automobilist should squip his car with Brampton chains if he wants to get what is coming to him.

With best wishes for your continued sucess, I am

Dict.
H. S. M. - G/

Yours very truly,

Harry S. Morris

1906 CARS

Do you want this kind of chain on your 1906 car? You can have it if you ask the manufacturer to fit the Brampton chain to your car and with no extra expense to you or the manufacturer. All standard sizes in stock to fit American and Foreign cars. Catalogue mailed on request.

CHAS. E. MILLER

Manufacturer, Jobber, Exporter and Importer

Home Office 97-99-101 Reade St., New York

BRANCHES: Broadway and 38th St., New York. 318 and 320 No. Broad St., Philadelphia, Pa. 202 and 204 Columbus Avenue, Boston, Mass. 406 Erie St., Cleveland, O.

The Largest Automobile Supply House in America

8,000 MILES

Perfect Satisfaction. Never Breaking

HOTEL TOURAINE
BOSTON

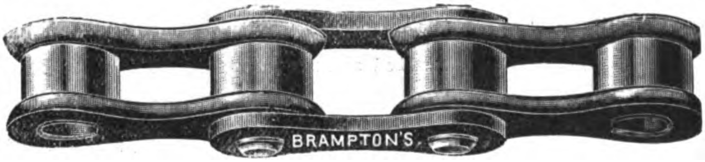
July 3d, 1905.

BRAMPTON, BROS., Ltd.,

Dear Sirs:—It is a pleasure for me to say that the chains made by you and used on the world's tour have given perfect satisfaction, never breaking. They have carried us over New Zealand's mountains, the bad roads of Australia, and through many countries. The set sent you herewith has been used for 8,000 miles

Very truly yours,
(Signed) CHAS. J. GLIDDEN.

Weight of car, baggage and passengers, 4200 lbs.

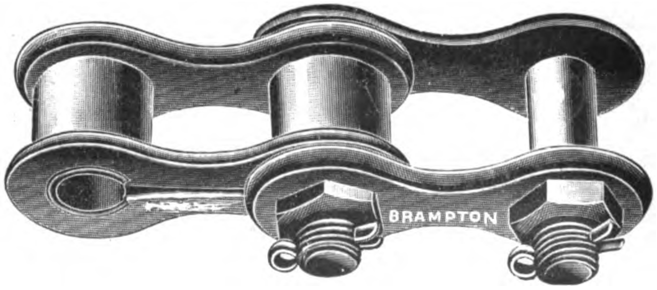


The Celebrated BRAMPTON CHAIN

Made from self-hardening steel. The strongest chain in the world. Note heavy chamferred side plates. This chain is polished as smooth as a looking glass, and fits and revolves on sprockets without friction.

We are sole United States agents for this line of chains, and are ready to quote manufacturers on American standard sizes at same price as American made chain.

THE BRAMPTON Connecting Link



The Celebrated Brampton Chains are fitted with connecting links as per illustration. It may not be necessary to have such a secure fastening, but Brampton thinks this the proper kind, **A Chain is no stronger than its weakest link.**

BRAMPTON CHAINS HAVE NO WEAK LINKS

Catalogue mailed on request

CHARLES E. MILLER, MANUFACTURER, JOBBER, EXPORTER and IMPORTER

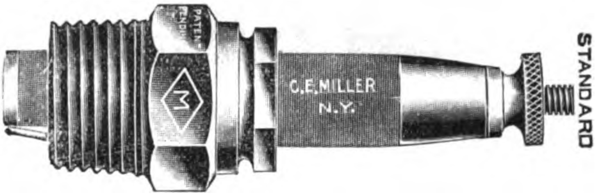
HOME OFFICE: 97-99-101 Reade St., New York City

BRANCHES:—Broadway and 38th St., New York. 318 and 320 N. Broad St., Philadelphia, Pa. 202 and 204 Columbus Ave., Boston, Mass. 406 Erie St., Cleveland, O.

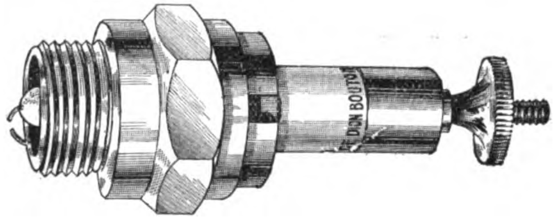
The Largest Automobile Supply House in America

The Miller Mica Spark Plug

GUARANTEED FOR 90 DAYS

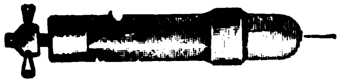


This plug has been on the market for the past four years and there are thousands of them in use and is considered one of the best on the market, and is guaranteed for 90 days. Price of Standard size $1.50 each. We can furnish any special size to fit any car on the market.



1906 Genuine DeDion Spark Plug

The DeDion spark plug has been on the market for several years and is one of the best known plugs on the market. We have sold 10,000 to one manufacture for use on the 1906 cars. One size only with French thread. Price, $1.50 each.

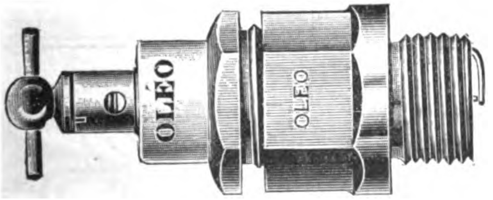


1905 DeDion Porcelain

We furnish Porcelain complete with Wire, terminal post and wing nut as per cut to repair the 1906 D. B. Plug. Price, each 24 cents.

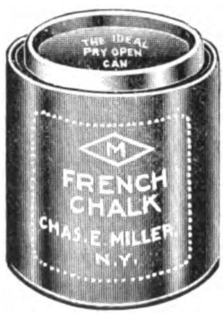
We furnish porcelain complete with Centre Electrode and Binding Post as shown in cut to repair the 1906 DeDion Spark Plug. Price, each 25 cents.

Oleo Spark Plug



This is a well-known French Plug and will spark under all conditions. Absolutely soot proof.

Price, each, Metric size - - - - $1.25
Price, each, ½-Metric size Pipe Thread 1.25



French Talc

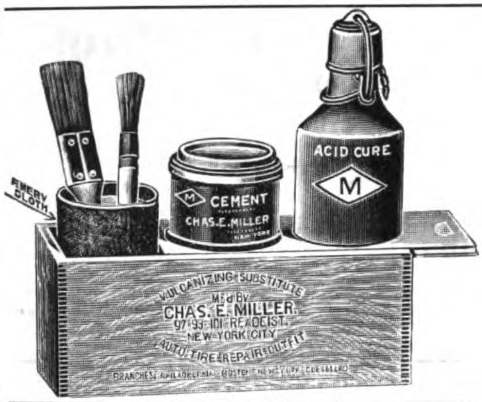
The above illustration shows our one-pound air tight package of powdered French Chalk. This is a very convenient and necessary article for repair men, as well as owners of automobiles, who wish to replace inner tubes in the casings, as it prevents the tube from sticking and chafing. This is a handy package to carry in the repair kit, and is furnished in tin can. List price, per lb. 12 cents.

We will exhibit at the Automobile Show held by The Automobile Club of America at the 69th Armory, New York City, January 18th to 20th, room "K", main floor to the right of entrance. We will exhibit at Madison Square Garden same week, space No. 189.

CHAS. E. MILLER, Manufacturer, Jobber, Exporter and Importer
Home Office, 97-99-101 Reade St., New York

BRANCHES: Broadway and 38th St., New York. 318 and 320 No. Broad St., Philadelphia, Pa.
202 and 204 Columbus Ave., Boston, Mass. 406 Erie St., Cleveland, O.

The Largest Automobile Supply House in America

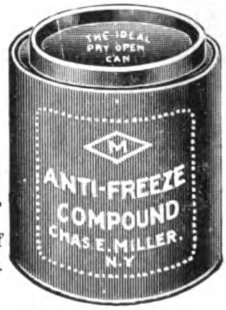

EMERY CLOTH
CEMENT
CHAS. E. MILLER
ACID CURE
M
VULCANIZING SUBSTITUTE
M'f'd By
CHAS. E. MILLER
97-99-101 READE ST.
NEW YORK CITY
AUTO TIRE REPAIR OUTFIT

MILLER'S "DIAMOND M" Vulcanizing Substitute

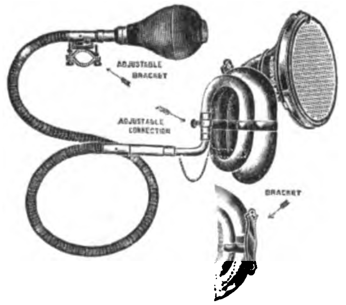
TOURIST KIT. For tourists we furnish a kit packed in a wooden box with sliding top, ¼ pint each Cement and Acid Cure, a piece of emery cloth and 2 brushes for applying cement and acid.
Price, each, $1.20

For Shop Use. We furnish this substitute in boxes containing one pint each or one quart each, cement and acid solution. **Price, $1.50 and $2.75.**

MILLER'S M Anti-Freeze Compound


THE IDEAL PRY OPEN CAN
M
ANTI-FREEZE COMPOUND
CHAS. E. MILLER.
N.Y.

Ten pounds of this compound added to two gallons of water will not freeze at 15 degrees below zero. Price of 10-pound can, $1.00.


ADJUSTABLE BRACKET
ADJUSTABLE CONNECTION
BRACKET

"LA BASSOON" HORNS

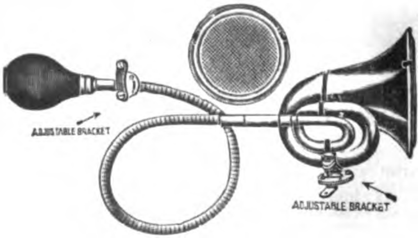
This is one of the latest ideas in a horn and is distinctly new. You will notice from the cut that this horn is made with an extra coil in the body of the horn similar to "La Tuba." This extra coil has the result of producing a very deep and musical tone. All our horns are spun from heavy brass and are highly polished. The illustration shows the adjustable bracket fitted to both horn and tube so that they may be attached to any kind of a car and in any position desired. The reeds and bulbs are guaranteed for one year.

No. 15 L. B. Diameter of bell 7 inches. Polished brass only. Complete with 40 inch flexible tube and screen, $9.50.

No. 14 L. B. same as No. 15, except diameter of bell is 6½ inches. Price, complete, $8.00.

"LA TUBA" HORN

This is another one of the latest (double bend) style of horns, similar to "La Bassoon". Fitted with adjustable brackets and produces a deep and lasting tone. Three sizes, complete with tube. Price each, $7.00, $8.50, $9.50.


ADJUSTABLE BRACKET
ADJUSTABLE BRACKET

CHAS. E. MILLER, MANUFACTURER, JOBBER, EXPORTER and IMPORTER

HOME OFFICE: 97-99-101 Reade St., New York

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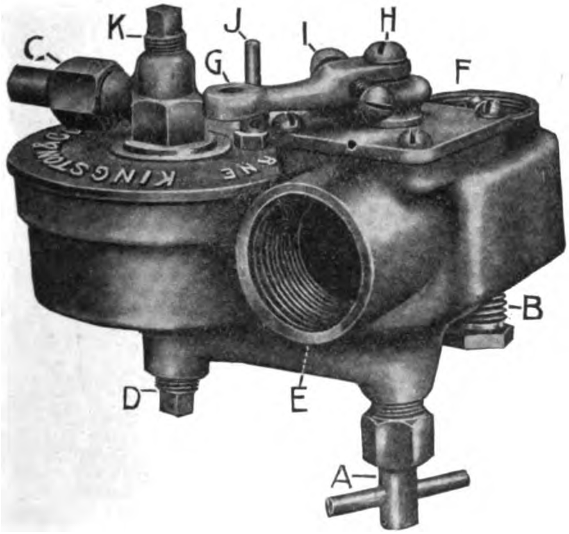
KINGSTON

Type-K Carburetor



1906

Model

Light Valve
Automatic Type

This Carburetor will give perfect control and more power than any other.

Over 31,000 Kingston Carburetors in Use.

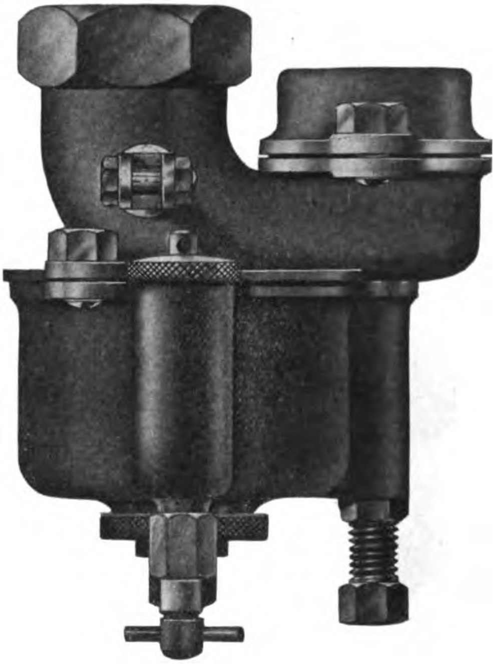
Byrne, Kingston & Co.

KOKOMO, INDIANA, U. S. A.

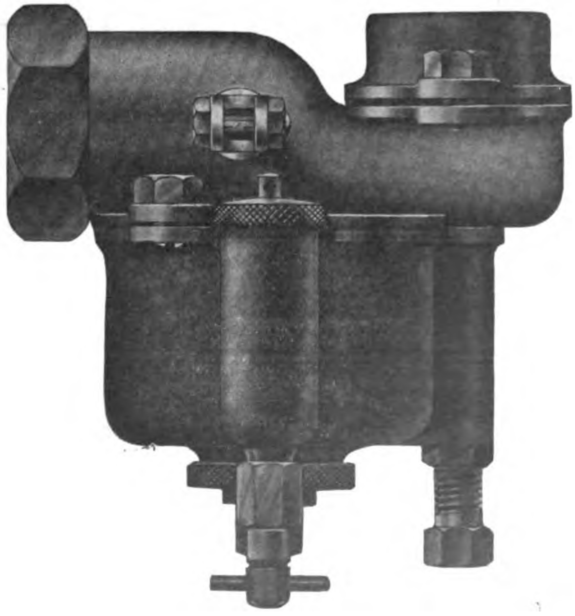
... See Us at Chicago and both New York Shows ...

KINGSTON
Type-Kc CARBURETOR

This Carburetor is of the Central Float Chamber type, with weighted valve. Part of the air is taken through center of float chamber, which opening is adjustable, is also fitted with light metal auxiliary air valve seating on leather, is fitted with a piston throttle of the balanced type. Is noiseless and automatic.



VERTICAL OUTLET



HORIZONTAL OUTLET

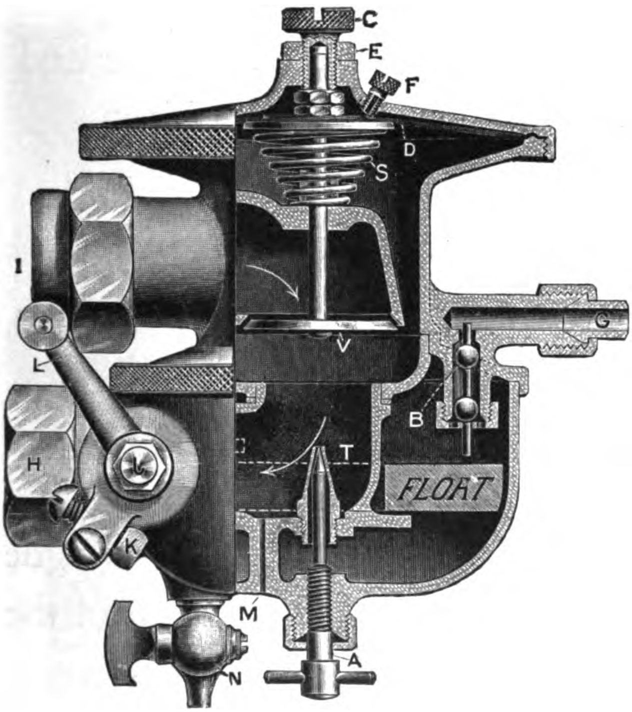
Over 31,000 Kingston Carburetors in use

Byrne, Kingston & Co.,
Kokomo, Indiana, U. S. A.

SEE US AT CHICAGO AND BOTH NEW YORK SHOWS

KINGSTON

TYPE-D AUTOMATIC CARBURETOR



Absolutely the most perfect carburetor on the American market.

Diaphragm and air control which is perfect.

Fully Guaranteed.

Over 31,000 Kingston Carburetors in Use

Write for Catalogue and Price-list of Kingston's Line

Byrne, Kingston & Co.

KOKOMO, INDIANA, U. S. A.

See Us at Chicago and both New York Shows

KINGSTON MUFFLERS

KINGSTON
MUFFLER & CUT-OUT
COMBINED
PAT. PENDING.

Are being adopted by nearly all Automobile and Motor Boat manufacturers.

Made in all sizes and shapes for any and all kinds of service.

KINGSTON
MARINE MUFFLER
PAT. PENDING.

KINGSTON
PLAIN MUFFLER
PAT. PENDING.

Write for Catalogue and Price List of the Kingston line.

Over 12,000 KINGSTON MUFFLERS in Use

WHICH PROVES THEIR MERIT

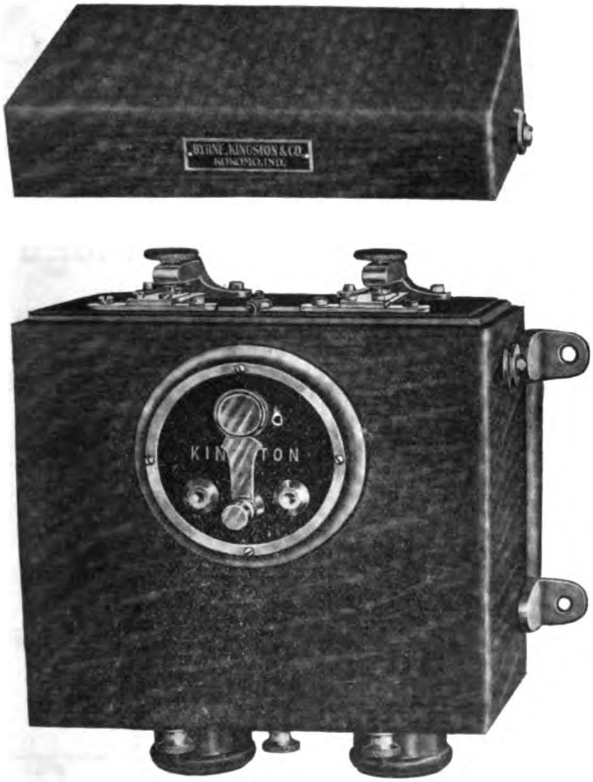
Byrne, Kingston & Co.

KOKOMO, INDIANA, U. S. A.

See us at Chicago and both New York Shows

KINGSTON

SPARK COILS



Are absolutely the best made and the most elegantly finished coils ever placed on the market. They are strictly hand made in our own laboratory under our own supervision, where every winding is made by hand, after which they are thoroughly insulated and tested, assembled and all interior connections insulated with rubber and tested, after which the sealing compound is added. They are then mounted in elegant lock cornered cases which are hand polished, the finish being moisture and weather proof and fitted with nickeled metal trimmings with vibrators having a wide range of adjustment, making them suited to a very weak or strong battery or magneto. All dash coils are of the individual unit system fitted with a metal rimmed, two-throw switch.

Byrne, Kingston & Co.

KOKOMO, INDIANA, U. S. A.

SEE US AT CHICAGO AND BOTH NEW YORK SHOWS

KINGSTON
PLAIN
COILS AND PLUGS

Our Plain Coils are of the same construction exactly as our dash coils, fitted with the same vibrator. There are no cheap special jobs, they are all alike, you buy a Kingston you get the best and at the right price.

KINGSTON
Spark Plugs

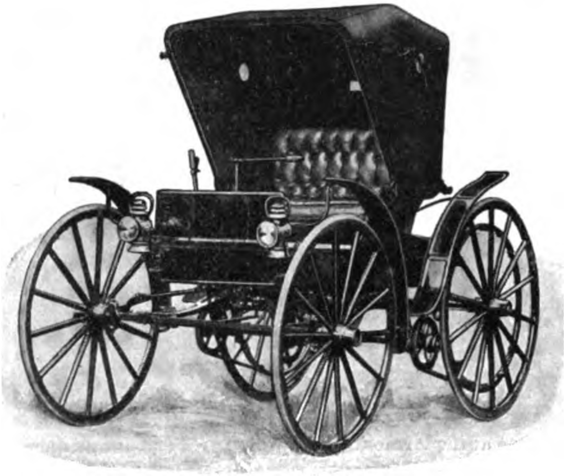
ARE THE BEST THAT CAN BE MADE AND AT THE RIGHT PRICE.

Byrne, Kingston & Co.

KOKOMO, INDIANA, U. S. A.

See Us at Chicago and both New York Shows

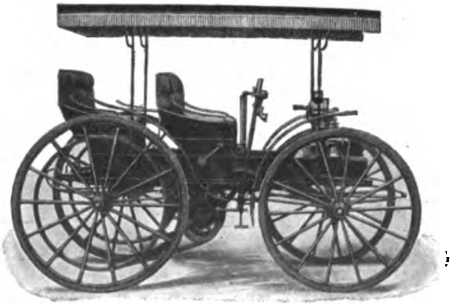
HOLSMAN



Model No. 3

FOUR YEARS OF SUCCESS. Built high enough to travel the country roads like a carriage. Clears the center of the road by eighteen inches, and therefore has **twice the advantage** of the ordinary machine in muddy, rutty, rough or rocky roads. Has large wheels, solid rubber tires, and **rides like a carriage.** The Holsman exclusive patent marks an era in automobile building. It **does away with** all live axles, friction clutches, differential gears, pumps, etc. Reverses without extra gears.

No water to freeze; no puncture troubles;
no odor; new hill-climbing power



Model No. 6

The Holsman Automobile Co.

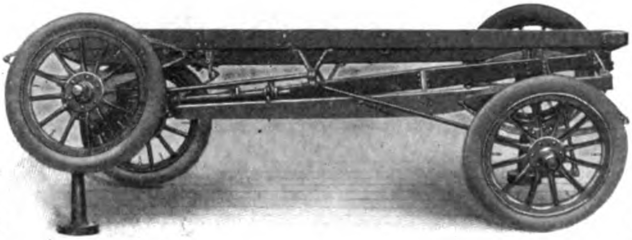
MONADNOCK BLOCK, CHICAGO, ILL.

Ask for Catalogue C

THE MARMON

"A Mechanical Masterpiece"

Front wheel and opposite rear wheel each raised over a foot



A Show that Lasts All Year

We shall demonstrate at the Armory Show, New York, and at other shows.

But, for the man who doesn't go, we offer here an Automobile Show that needs very little explanation, even to a novice.

The Marmon is **naturally** flexible. You can see that.

It moves over rough roads with an easy, gentle sway—a very luxury of motion—unknown in any other car. You can see why. Its running gear adjusts itself instantly and **Without strain** to any position which the road demands.

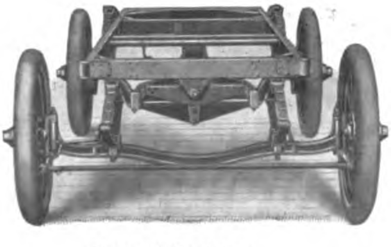
Other cars have but one frame. Some have an attachment called a sub-frame, but it is all rigid. The only flexibility attained in other cars is an uncertain variety provided by the springs and tires, and these do not eliminate jolts or sufficiently protect the costly mechanism from binding, twisting strains and ruinous friction. Anyone knows that the best of tires can not and do not endure the excessive and unnatural burden thrust upon them by the cumbersome, unyielding construction.

Observe that, in the Marmon, raising one wheel does not affect the other three wheels in the slightest. The two frames operate independently of each other, due to a **patented** exclusive Marmon feature.

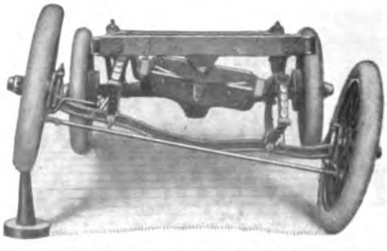
Double Three-Point Suspension

Each frame is suspended on three **pivotal** points. The sole duty of the upper frame is to carry the luxurious solid cast aluminum body.

The lower frame carries the entire power plant. Motor, transmission, driving shaft and live rear axle are a unit in operation—always in perfect alignment, free from twisting and binding strains, no matter how the two frames are raised, lowered or tilted. The Marmon driving shaft is therefore straight and rigid—without flexible couplings or power wasters of any sort. This means power transmission as perfect as can be had in a stationary power plant



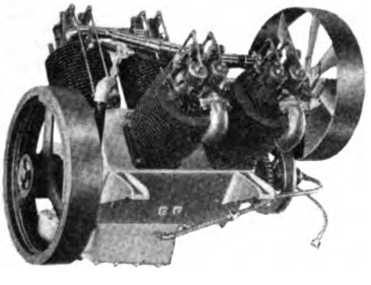
Normal Position.



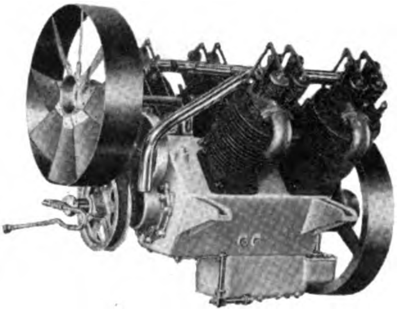
Front Wheel Raised Over a Foot. Body Level

THE MARMON

"A Mechanical Masterpiece"



Half Rear View



Half Front View

The One Unfailing Oiling System
The One Perfect Air-Cooled Motor

The Marmon lubrication system is superior to splash, gravity or any other known oiling plan. Starting and stopping with the starting and stopping of the motor, a **constant** and **uniform** flow of oil is forced through the hollow crank shaft (solid forging, drilled) **directly into** all the main engine bearings, crank and piston pin bearings. Has no adjustments, no uncertainties; needs almost no attention. Has no equal for economy. One gallon of lubricating oil runs the Marmon from 600 to 1000 miles.

Four cylinder motor, perfectly air-cooled. Never sticks or overheats; very powerful, quiet and smooth running. Improved spark and throttle control on steering wheel.

In general excellence of construction, we believe we are justified in saying that the Marmon is in a class by itself.

It is made by a company that has for **over fifty years** maintained a high reputation for the excellence of its mechanical products.

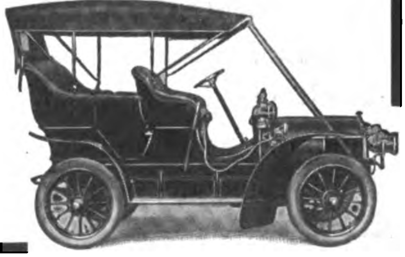
We build the car complete, all of it excepting the tires, wheels, springs, ignition, etc. We make our castings; iron, aluminum, brass and bronze; do all machine work, all sheet metal work including frames; build our bodies, trim and finish them; all of which results in consistent construction and of a grade excelled by no other manufacturer and equaled by few.

The result is that we build, not many cars, but excellent cars, every one of them "A Mechanical Masterpiece."

To anyone who really seeks the best, the exclusive mechanical beauty, superb workmanship, and stylish appearance of the Marmon need little more than an introduction.

Our Booklet No. 5 contains a complete description. Yours for the asking.

FOUR CYLINDERS AIR-COOLED { **Model C, Four Passengers, $2,500**
Model D, Five Passengers, $3,000



Nordyke & Marmon Co.

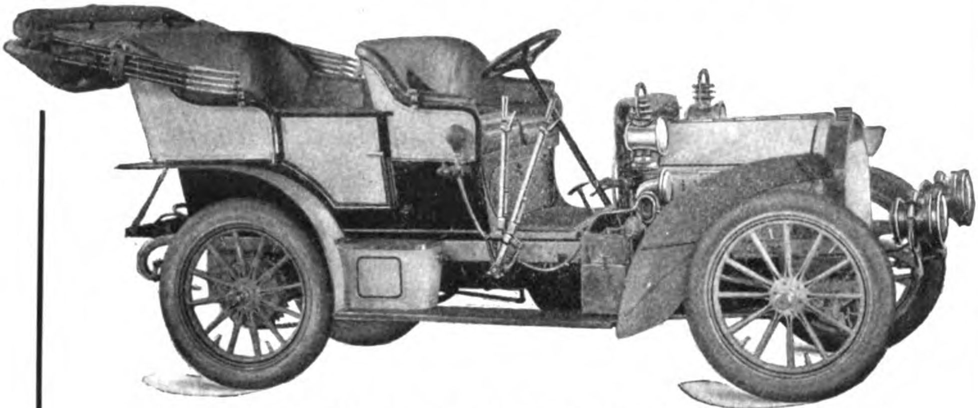
(ESTABLISHED 1851)

Indianapolis, Indiana

Member American Motor Car Manufacturers' Association.

Locomobile

EASILY THE BEST BUILT CAR IN AMERICA



TYPE E, 15-20 H. P. $3000

Top and Luggage Carrier Extra

We announce two new styles for 1906

A 15=20 H. P. CAR, $3,000

AND

A 30=35 H. P. CAR, $5,000

both with complete touring equipment. These models are almost identical in design, contain the same carefully selected material, and are constructed with equal care throughout—the result of years of careful and consistent manufacture of the standard type of four-cylinder touring cars.

Locomobiles are fully equal in mechanical details and running qualities to the best imported cars, but are especially designed for American roads.

Printed matter, illustrating and describing 1906 *Locomobile* cars, will be mailed on application to our factory or to any branch office.

Specifications of 1906 Models

Type "E" Locomobile—15-20 H. P.

PRICE, $3,000. with 5 brass lamps, horn, tire carrier, set of tools, extra parts, jack, lock box for tools and lubricants.

BODY, double side entrance, seating 5; fitted with top irons; color and striping optional.

MOTOR, 4 cylinder, 3¾" bore, 4½" stroke.

CRANK SHAFT, machined from one solid forging.

CAM SHAFTS, hardened forgings, all cams integral.

LUBRICATOR, large mechanical lubricator.

CARBURETER, automatic, with balanced throttle valve.

GOVERNOR, centrifugal type, positive in action.

CONTROL, Gas and spark levers on steering wheel.

IGNITION, make-and-break, with iridium contacts.

MAGNETO, low tension, our own design and manufacture,

ALUMINUM PAN, placed underneath the machinery.

CLUTCH, cone type with ample surface.

TRANSMISSION, 3 forward speeds and reverse.

DRIVE, double side chains.

UNIVERSAL JOINT, between clutch and transmission.

RUNNING BRAKE, double acting, metal to metal.

HAND BRAKES, internal expansion, metal to metal.

BRAKE, bolted to each rear wheel spoke.

AXLES, "I" section hand-welded axles.

FRONT FENDERS, have inner wings extending to bonnet.

RUNNING BOARDS, rubber covered and brass bound.

TIRES, 32 inch x 4 inch on all four wheels.

WHEEL BASE, 93 inches.

Type "H" Locomobile—30-35 H. P.

PRICE, $5,000. with 5 brass lamps, horn, tire carrier, set of tools, extra parts, jack, lock box for tools and lubricants.

BODY, double side entrance, seating 5 to 7; fitted with top irons; color and striping optional.

MOTOR, 4 cylinder, 4½" bore, 5½" stroke.

CRANK SHAFT, machined from one solid forging.

CAM SHAFTS, hardened forgings, all cams integral.

LUBRICATOR, large mechanical lubricator.

CARBURETER, automatic, with balanced throttle valve.

GOVERNOR, centrifugal type, positive in action.

CONTROL, spark and gas levers on steering wheel.

IGNITION, make and break, with iridium contacts.

MAGNETO, low tension, our own design and manufacture.

ALUMINUM PAN, placed underneath the machinery.

CLUTCH, cone type with ample surface.

TRANSMISSION, 3 forward speeds and reverse.

DRIVE, double side chains.

UNIVERSAL JOINT, between clutch and transmission.

RUNNING BRAKE, double acting, metal to metal.

HAND BRAKES, internal expansion, metal to metal.

BRAKE, bolted to each rear wheel spoke.

AXLES, "I" section hand-welded axles.

FRONT FENDERS, have inner wings extending to bonnet.

RUNNING BOARDS, rubber covered and brass bound.

TIRES, 34 inches x 4½ inches.

WHEEL BASE, 106 inches.

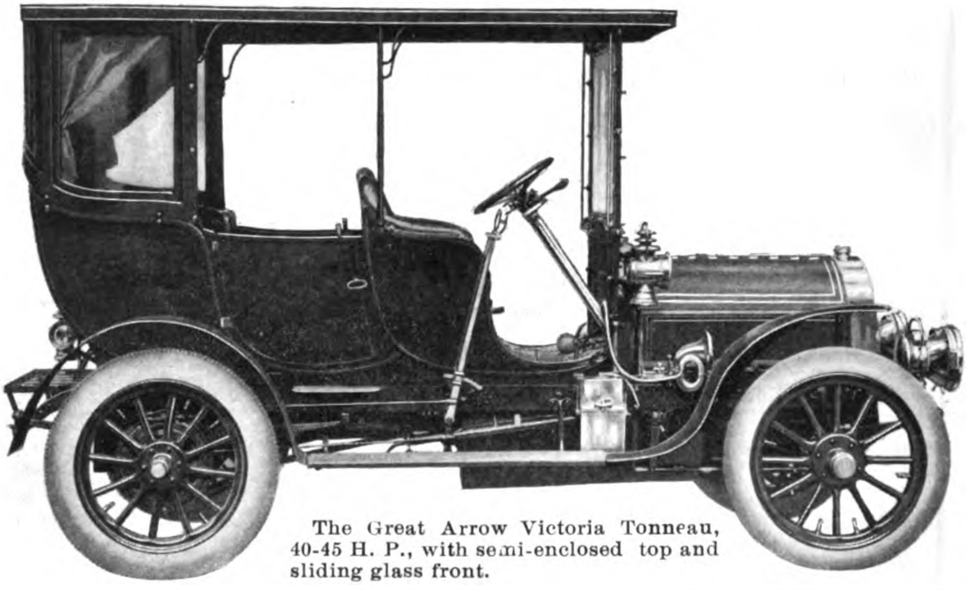
For 12c. in stamps we will mail a set of 12 souvenir postal cards of the Vanderbilt Cup Race, showing 12 views of the *Locomobile* which finished third in the race, placing America second by countries and making the best showing ever made by an American car in an international contest. For 10c. in stamps we will mail a five-color poster showing the *Locomobile* finishing in this race. This poster may be framed with or without advertising matter.

The *Locomobile* Company of America, Bridgeport, Conn.

NEW YORK, Broadway and 76th St.
PHILADELPHIA, 249 N. Broad St.

Member of Association Licensed
Automobile Manufacturers

BOSTON, 15 Berkeley St.
CHICAGO, 1354 Michigan Ave.



The Great Arrow Victoria Tonneau, 40-45 H. P., with semi-enclosed top and sliding glass front.

PIERCE

Specifications for the 40-45 H. P. Car

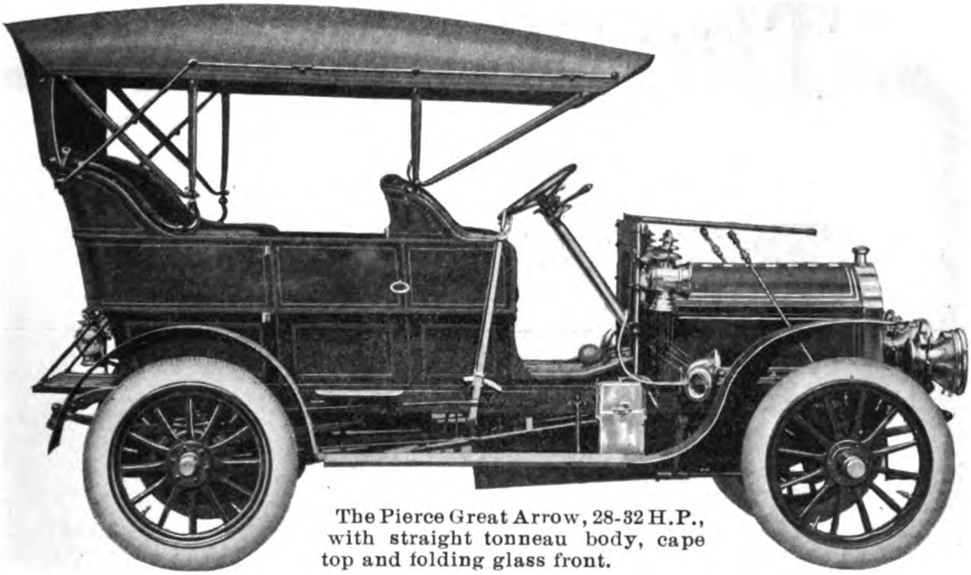
Number of cylinders	4.
Diameter and stroke	5 x 5½.
Revolutions per minute	1100 to 1500.
Ignition	Jump spark. 5 individual Unit Autocoil.
Battery equipment	1 set Storage. 1 set Dry.
Carbureter	Special Automatic.
Control	Automatic Throttle Governor.
Oiling	Automatic to all Crank Shaft and Pin Bearings, Cylinders and Pistons.
Gasoline capacity	20 gallons.
Radiator	Whitlock type.
Transmission	Sliding gear, direct on high speed. Bevel Gear Drive.
Speeds	3 Forward and Reverse.
Bearings	Ball bearings all over except Motor. Hess-Bright Bearings in Transmission,
Frame	Pressed Special Carbon Steel, Channel Section, 4½" to 2⅞" deep.
Wheel Base	109 inches.
Wheel tread	56 inches.
Wheels	Wood Artillery, 36 inch
Regular tires	Goodrich 4½" front, 5" rear. Goodrich-Bailey Non-Skid on rear.
Body type	Side entrance tonneau.
Regular color	Dark Brewster Green body and running gear. Light green striping.
Material	Cast Aluminum.
Brakes	Foot brakes on inside of drums on hubs, both rear wheels. Hand brakes on outside of drums on hubs, both rear wheels.
Equipment	2 Side oil lamps, 1 Tail oil lamp, 2 Head gas lamps and generator, Horn and full set of tools, Gasoline tank gauge, Veeder odometer, 4 Shock Absorbers, Extra tire carrier, Trunk rack.
Weight (approximate)	3100 pounds.

Price of the Great Arrow Victoria, without top, $5,000. Semi-enclosed top, $350 extra. Cape top, $200 extra. Folding glass front, $50 extra. F. O. B. Buffalo.

LIST OF DEALERS EAST OF PITTSBURG

BOSTON—J. W. Maguire Co., 745 Boylston St.
NEW YORK—Harrolds Motor Car Co., Broadway, 58-59th Sts.
BALTIMORE—Southern Auto Co., 2021 Maryland Ave
BUFFALO—The George N. Pierce Co., 752 Main St. (Retail)
HARTFORD, CONN.—The Miner Garage Co., 120 Allyn St.
OTTAWA and MONTREAL—Wilson & Co., 142 Bank St.
PHILADELPHIA—Foss-Hughes Motor Car Co , 201 N. Broad St.
PORTLAND, ME.—J. A. Dowling.
PROVIDENCE—The Shepard Co,
ROCHESTER—U. S Automobile Co , 21 Plymouth Ave.
SARATOGA SPRINGS—W. L. Hodges, 16 Woodlawn Ave.
SCRANTON, PA—Standard Motor Car Co.
SPRINGFIELD. MASS.—E. R. Clark Auto Co., 117 Lyman St.
SYRACUSE—Amos-Pierce Auto Co., 109 S. State St.
TORONTO—Auto & Supply Co., Ltd., 24 Temperance St.
TROY, N. Y.—Troy Auto Exchange, 22 Fourth St.
UTICA N. Y.—Utica Motor Car Company.

For Agents West of Pittsburg. see other page.



The Pierce Great Arrow, 28-32 H.P., with straight tonneau body, cape top and folding glass front.

PIERCE

Specifications for the 28-32 H. P. Car

Number of cylinders	4.
Diameter and stroke	4¼ x 4¾.
Resolutions per minute	1200 to 1600.
Ignition	Jump spark. 5 individual Unit Autocoil.
Battery equipment	1 set Storage. 1 set dry.
Carbureter	Special Automatic.
Control	Automatic Throttle Governor.
Oiling	Automatic to all Crank Shaft and Pin Bearings, Cylinders and Pistons.
Gasoline capacity	18 gallons.
Radiator	Whitlock type.
Transmission	Sliding gear, direct on high speed. Bevel Gear Drive.
Speeds	3 Forward and Reverse.
Bearings	Ball bearings all over except Motor. Hess-Bright Bearings in Transmission.
Frame	Pressed Special Carbon Steel, Channel section 4½″ to 2⅜″ deep.
Wheel base	107 inches.
Wheel tread	56 inches.
Wheels	Wood Artillery, 34 inch.
Regular tires	Goodrich 4″ front. 4½′ rear. Goodrich-Bailey Non-Skid in rear.
Body type	Side entrance tonneau.
Regular color	Dark Blue body and running gear. Light blue striping.
Material	Cast Aluminum.
Brakes	Foot brakes on inside of drums on hubs, both rear wheels. Hand Brakes on outside of drums on hubs, both rear wheels.
Equipment	2 Side oil lamps, 1 Tail oil lamp, 2 head gas lamps and generator, Horn and full set of tools, Gasoline tank Gauge, Veeder Odometer, 4 Shock Absorbers, Extra tire carrier, Trunk rack.
Weight (approximate)	2700 pounds.

Price of the Great Arrow 28-32 H. P., without top, $4,000. Semi-enclosed top, $350 extra. Cape top $200 extra. Folding Glass Front, $50 extra. F. O. B. Buffalo.

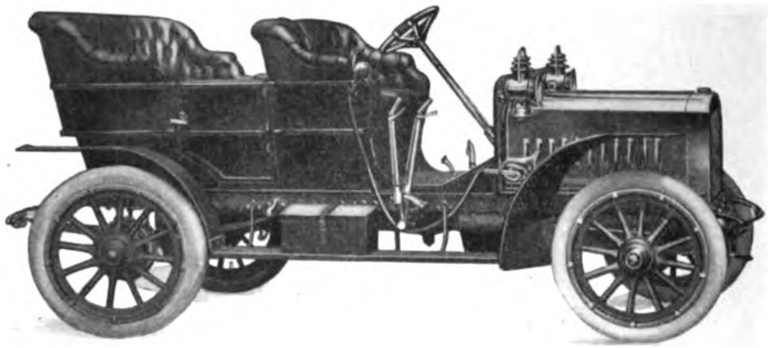
LIST OF DEALERS WEST OF PITTSBURG

CHICAGO—H. Paulman & Co., 1321 Michigan Ave
PITTSBURG—Banker Bros. Co., Baum and Beatty Sts.
DETROIT—J. P. Schneider, 189 Jefferson Ave.
DENVER—The George N. Pierre Co., 1613 California St.
HOUSTON, TEX—Hawkins Auto & Gas Engine Company.
KANSAS CITY, MO.—E. P. Moriarty & Co., 1612 Grand St.
LOS ANGELES—Bush & Burge, Cor. 7th and Main Sts.
LOUISVILLE, The Zorn-Strauss Co., Inc.
MILWAUKEE—Hibbard Automobile Company.
OAKLAND, CAL.—The George N. Pierce Co., 1013 Clay St. (Wholesale).
SAN FRANCISCO—Mobile Carriage Co., Golden Gate Ave. & Gough St.
ST. LOUIS—Western Co. 4701 Washington Boulevard.
ST. PAUL—C. P. Joy Auto. Co., 368 Minnesota St.

For Agents East of Pittsburg, see other page.

The Autocar

Type XII $2600



The modern-to-the-minute, FIVE-passenger car. Four-cylinder, vertical motor. 24 James Watt horse-power. (26 h. p. on test.) 40 miles.

Axles.—Front axle, seamless tubing. Rear live axle of steel, ground bearings, with squared ends at the wheels, obviating the use of keys at that point. Seamless tubing dust-proof case.

Body and Mud Guards.—Body and mud guards, wood. Double side entrance and doors. Five passengers.

Brakes.—Internal and external hub brakes. A foot lever controls the external; side hand lever the internal brakes, the hand lever first throwing out the clutch.

Color.—Bronze Blue.

Control.—Right-hand wheel steer with bevel gear and sector. Spark and throttle control grips in the rim of the wheel. A foot-operated clutch (left foot). Caster knuckles.

Cooling System.—Coil fin radiator with fan and centrifugal (gear driven) circulating water pump.

Frame.—Wood, continuous pressed steel channel reinforcement.

Ignition.—Large three-cell storage battery. Four-cell auxiliary dry battery. Four-point coil, gear driven spark timer on left side of crank case. Jump spark plugs.

Lubrication.—Crank shaft bearings are oiled directly. Cam shaft bearings oiled by continuous force feed of oil from mechanical (gear driven) oiler, as well as by splash. Force feed oiler is positive throughout—there is no dependence on gravity for oiling. Transmission and rear drive oiled by splash lubrication.

Motor.—Four vertical water-cooled cylinders, placed in front under the hood. Cylinders cast separately. Bore 4 inches, stroke 4½ inches, cylinders and pistons ground to size. Inlet and exhaust valves mechanically operated; fully adjustable. lower half of case removable without interfering with the bearings. Crank shaft oil tempered. All bearings ground to size. Motor and transmission are on the same pressed steel cradle, and protected by a metal motor shield.

Rear Drive.—Two drop-forged hardened steel bevel gears, with bevel gear differential. Hyatt roller bearings throughout, ample ball thrust bearings.

Springs.—Front and rear—semi-elliptic.

Tires.—Fisk "Heavy Car" type tires—32 inch by 4 inch.

Transmission.—Sliding gear type, drop forged, hardened steel of ample strength, their shafts carried on large Hyatt roller bearings. Splash lubrication. Three forward speeds and a reverse.

Tread and Wheel Base.—Fifty-six inch tread. One hundred inch wheel base.

Vaporizer.—Holley vaporizer, autocar type, at side of crank case.

Wheels.—Twelve spoke Midgley steel artillery wheels; reinforced construction; roller bearings.

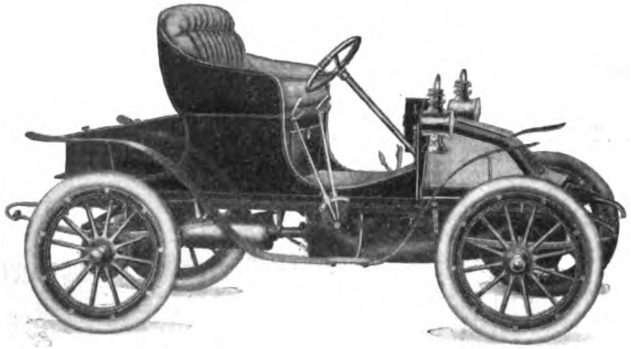
The Autocar Company

ARDMORE, PA.

Member Association Licensed Automobile Manufacturers

The Autocar.

Type X $1000



The best runabout, *made better*. Higher-powered; and with right-hand wheel steer and characteristic Autocar control.

Two-cylinder horizontal opposed motor. 12 James Watt horsepower. (13 h. p. on test.)

Axles.—Front axle, seamless tubing. Rear live axle, steel, ground bearings, squared end drive, no wheel keys necessary. Dust-proof case.

Body and Mud Guards.—Body, wood; mud guards and dashboard laminated wood. Improved carrying box in rear. No tonneau.

Brakes.—Band hub brakes on each wheel operated by foot pedal, and one on driving shaft, operated by side lever.

Control.—Right-hand wheel steer with bevel gear and sector. Spark and throttle control grips in the rim of the wheel (a new feature on this car). Foot-operated clutch controlled by the left foot. Caster knuckles.

Cooling.—Centrifugal water pump, gear driven, coil radiator in front under the frame.

Color.—Bronze blue.

Ignition.—Two batteries of three dry cells each, rotary spark timer, double spark coil, jump spark plugs.

Lubrication.—A few parts only are oiled directly, such as steering knuckles, steering post and gears. Engine oiled by mechanical (gear-driven) oiler and splash. Transmission and rear construction run in dust-proof cases in bath of oil, the splash from the gears lubricating all bearings and gears.

Motor.—Water-cooled. Two balanced horizontal opposed cylinders in front under the hood. Four inch bore, four inch stroke. Mechanical exhaust and automatic inlet valves. Drop forged steel connecting rods. Drop forged steel crank shaft. Oil tempered bronze bearings. All bearings ground to size.

Rear Drive.—Two hardened steel bevel gears and bevel gear differential. Driving shaft ball-bearing. Axles, Hyatt roller bearings, with ample ball thrust bearings.

Springs.—Semi-elliptic.

Tires.—Fisk "Heavy car" type, 28 inch by 3 inch.

Transmission.—Well known sliding gear or French type. Drop forged, hardened steel gears. Shafts run on ball bearings. Splash lubrication. Three forward speeds and reverse.

Tread and Wheel Base.—Fifty-four inch tread. Seventy-six inch wheel base.

Vaporizer.—Holley vaporizer, auto car type, in front of motor.

Wheels.—Twelve spoke Midgley all-steel artillery wheels. Reinforced construction. Roller bearings.

Higher development of reliability, accessibility and control.

The Autocar Company

ARDMORE, PA.

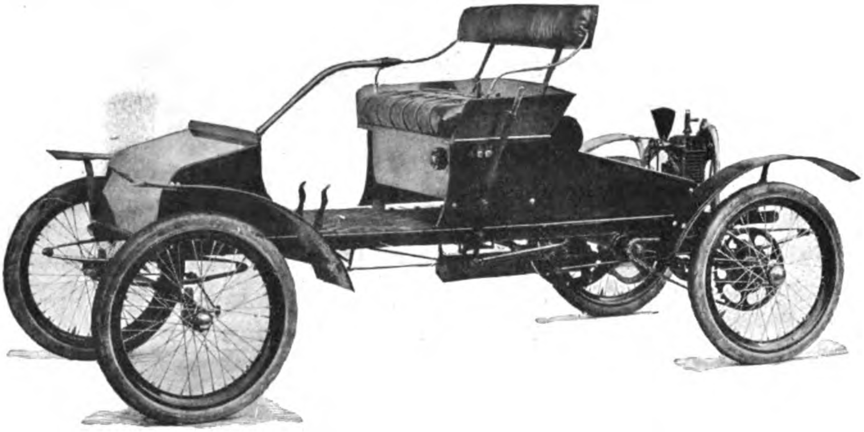
Exhibits in New York at Madison Square Garden ONLY

Orient

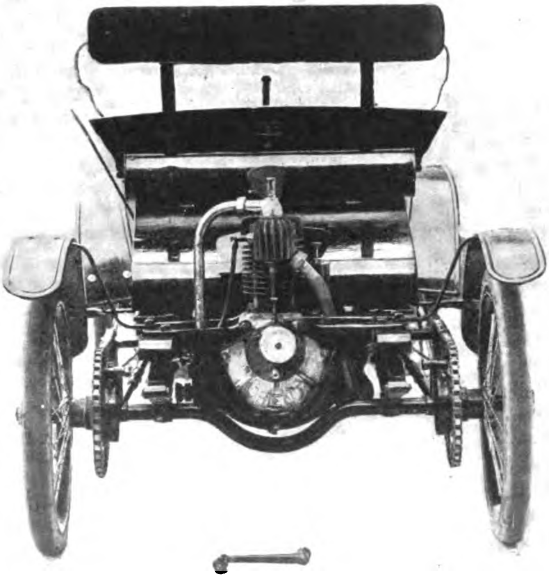
1891
1906

FRICTION-DRIVE
BUCKBOARD

Air Cooled Four H. P. 10-inch Clearance. Speed 30 miles an hour. Climbs 40 per cent. Grade. Weight 600 lbs.



Starts Easily. Numberless Speeds. Forward and Reverse, Fan on Engine. Oils from Seat. Elliptic Springs. Semi-rigid Frame.



REAR VIEW

A REMARKABLE MOTOR CAR FOR $400.00

As noiseless and Free from Vibration as a 4-cylinder Touring Car. Will climb grades and drive through sand and mud that no other motor car of any horsepower can negotiate. Its maximum driving ratio is 40 to 1—a high-powered touring car is but 18 to 1.

Gasoline Consumption 35 miles to one Gallon.

Oil Consumption 90 miles to one pint.

Operating Cost 1-3 of a cent per mile.

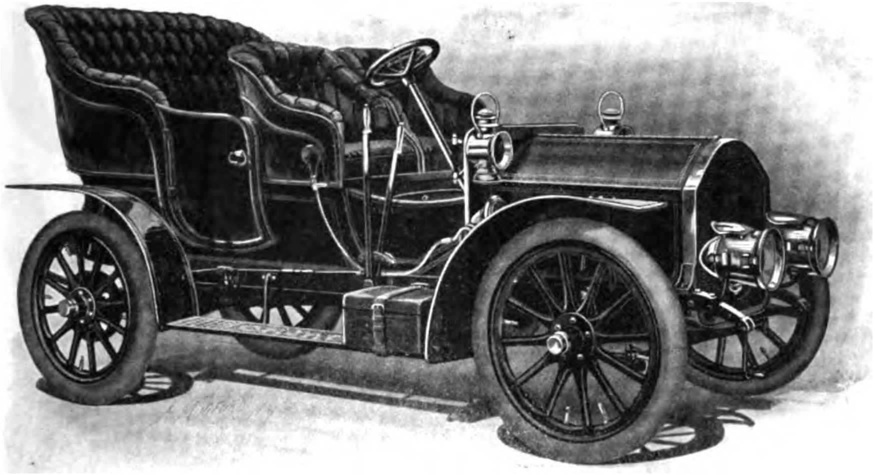
Responsible dealers desired in unassigned territory. Write for Catalog and Agency Proposition

WALTHAM MANUFACTURING COMPANY

GENERAL OFFICES AND FACTORY **WALTHAM, MASS., U. S. A.**

Members Association Licensed Automobile Manufacturers

Waltham-Orient



WALTHAM-ORIENT, MODEL R, $2250

The Car of To-day Must do More than Look its Price. The high priced, high powered motor car is all right—it has its place and its purchasers but the POPULAR DEMAND is for a car of moderate price, reasonable speed that will be maintained up-hill as well as on the level road; that will arrive on time and return when expected; that will keep on the road and out of the repair shop; that can be operated economically and safely and does not require the employment of a professional chauffeur; that will remain in service winter as well as summer.

It must look well—ride well—run well—and keep well. That's where your pleasure comes in. You pay your good money for it and you have a right to expect it.

It is because it combines all these important and necessary features that

The WALTHAM-ORIENT is the leading American car of its price

FIVE MODELS FOR 1906

MODEL R, a Swell Special, 20 H. P., - - - - - - $2250	MODEL M, 16 H. P., Runabout, Detachable Tonneau - $1750
MODEL N. 20 H. P. Tourist - $2000	MODEL K, 16 H. P. Two passenger Runabout - - - $1600
MODEL L, 16 H. P. Tourist - $	

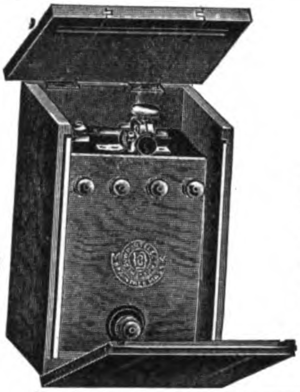
We are alive for live agents. Write for specifications and proposition. We will exhibit at New York, Chicago and Boston Shows.

WALTHAM MANUFACTURING COMPANY

General Offices and Factory, Waltham, Mass., U.S.A.

Members of Association Licensed Automobile Manufacturers.

DOW

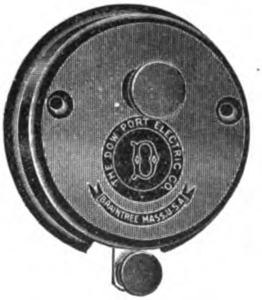


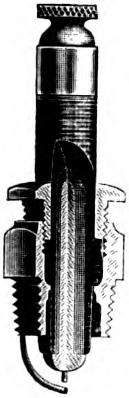
No. 76 Coil

This has been constructed to meet the demand for a coil with all connections convenient to get at by opening the front, which makes it a fine coil for some types of cars.

Dow Double Throw Switch

This can be used with one set of batteries and a dynamo, or with two sets of batteries, either separately or together, as desired.


THE DOW PORT ELECTRIC CO
BRAINTREE MASS U.S.A.



Dow Mica Spark Plug

We will make them to fit any engine upon receipt of an order for a reasonable quantity to be made at one time. Are carried in stock in ½ inch and ¾ inch standard pipe thread; also De Dion metric thread. These plugs have been on the market several years, and have demonstrated that they are absolutely reliable. The core is made of double insulated mica.

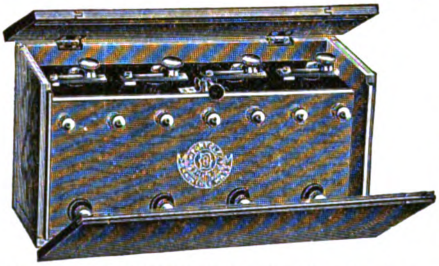
WRITE FOR DESCRIPTIVE CATALOGUE

Dow Portable Electric Co.
BRAINTREE, MASS.

L. H. & B. I BILL, 304 McAllister St., San Francisco, Cal.

DOW

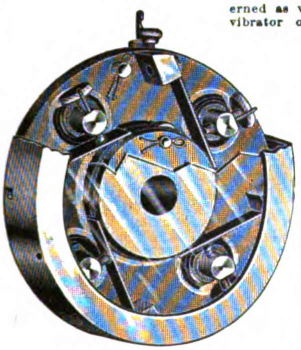
DASHBOARD COIL, French Type



Can be supplied with different vibrators to meet requirements. Is a very compact and efficient coil.

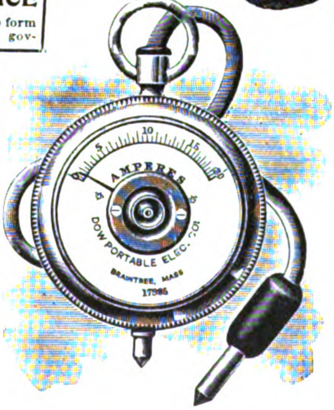
The New DOW TIMING DEVICE

is the simplest and most reliable form of commutator. Contact can be governed as wanted, and either a vibrator or non-vibrator coil can be used. It is dust and waterproof and so simple in construction that there is very little chance for anything to get out of order, or wear. It is made for single and multiple-cylinder engines.



Pocket Ammeter

will register accurately from one to thirty amperes. It is not an imported instrument, but an article manufactured by us and guaranteed to be equal to or superior to any on the market.



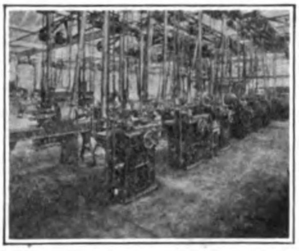
DOW PORTABLE ELECTRIC CO.

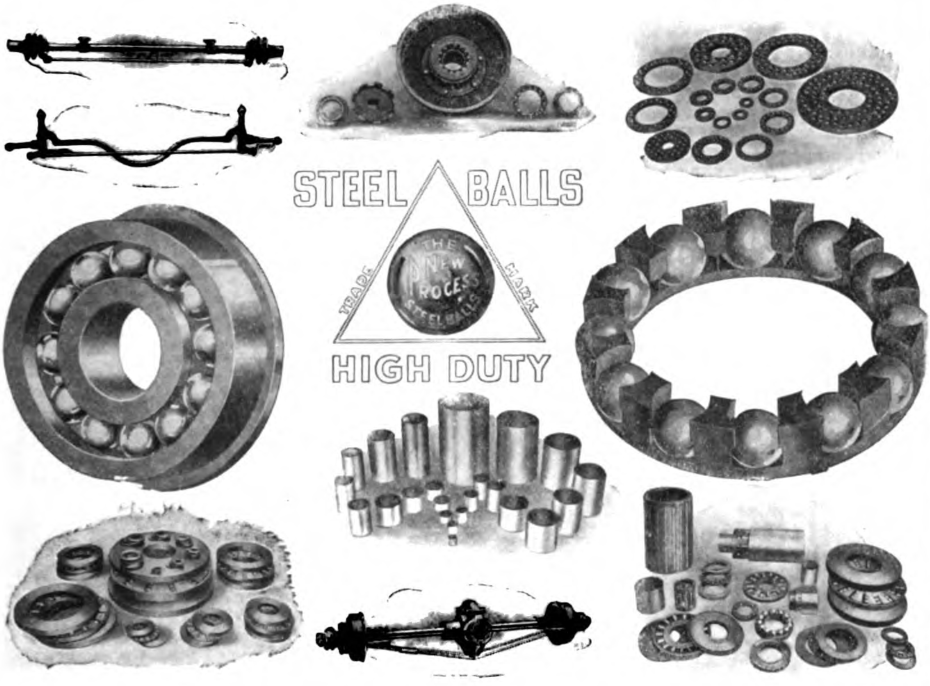
BRAINTREE, MASS.

L. H. & B. I. BILL, 304 McAllister St., San Francisco, Cal.

STANDARD ROLLER BEARING CO.
BALL FACTORY

STANDARD ROLLER
PHILADELPHIA
OUR PLANT AND PRODUCTS




STEEL BALLS
THE NEW PROCESS STEEL BALLS
TRADE MARK
HIGH DUTY

BEARING COMPANY

PENNYSLVANIA

SEND FOR NEW CATALOGUE

THE
MANUFACTURERS FOUNDRY
COMPANY.
WATERBURY. CONNECTICUT.

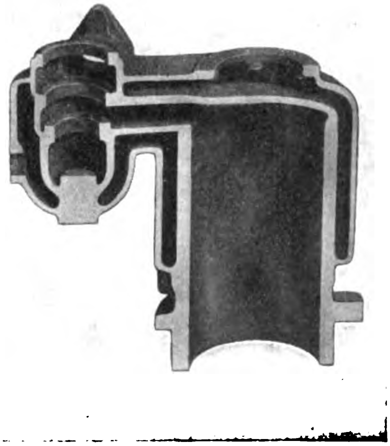
CYLINDER
CASTINGS

MEMBER

Send us patterns and we will submit sample castings with quotations.

THE
MANUFACTURERS FOUNDRY
COMPANY
WATERBURY, CONNECTICUT

We make the **Cylinder Castings** used by the leading automobile manufacturers. Our large capacity, modern equipment and long experience insures prompt delivery and the highest grade of castings.

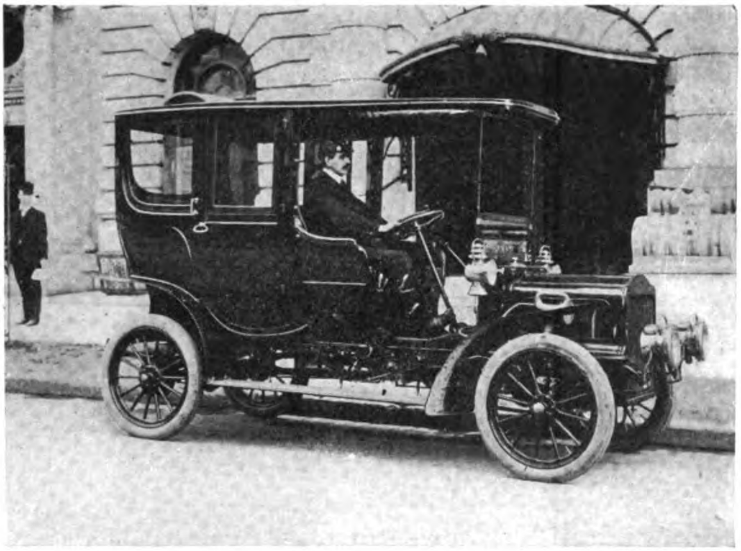


We are also equipped to make patterns and to machine cylinders to drawings. Send blueprints, and we will quote on patterns, castings and machining.

A trial order is all we ask.
We will do the rest.

The Incomparable WHITE

The Car for Service



WHITE CATALOG

Everyone interested in automobiles, whether steam, gasolene or electric, should write to us for the new catalog of the Model "F" White steam car. It contains, first of all, a brief historical sketch tracing the gradual perfection of the steam engine by the labors of many generations of engineers. Then is related how Rollin H. White, by the invention of an entirely new system of steam generation, whereby the boiler was eliminated, devised the first successful steam machine. This car was first offered the public in 1901.

Brief references are made through the catalog to the success of this first model and to the constant victories and notable achievements which every model of the White steamer has each year placed to its credit. There is also included a concise and lucid description of the White system. Finally, there are shown the various Model "F" cars—touring cars, limousines, landaulets, victorias, runabouts, extension landaulets—which we are now delivering.

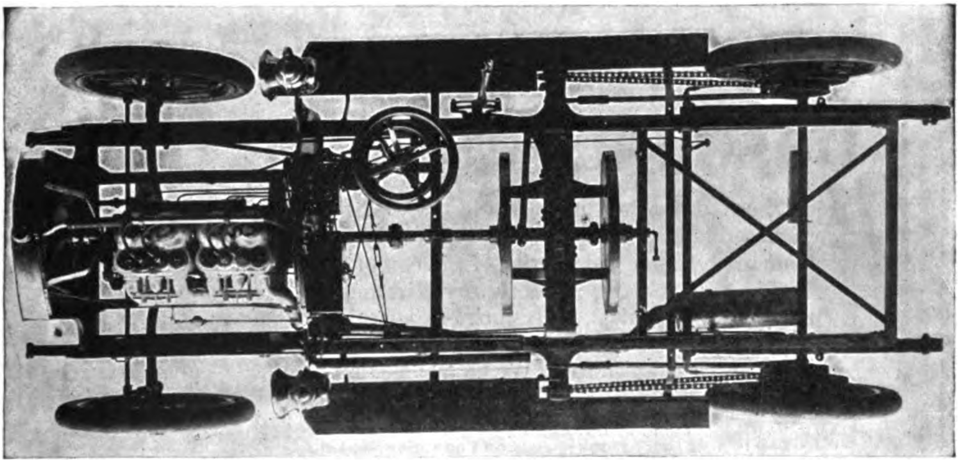
A POSTAL CARD TO US BRINGS THE CATALOG BY RETURN MAIL

WHITE SEWING MACHINE COMPANY

Cleveland, O.

THE WINDSOR

A CAR WITHOUT GEARS
THEREFORE WITHOUT TROUBLE



40 H. P. Price $2500

Simple, Safe, Durable and Powerful

ONE LEVER operates either forward or backward.
ANY SPEED desired. No set speeds.
LIGHT WEIGHT As all the usual heavy parts are eliminated.
OUR 40 H. P. ENGINES and our rolling traction transmission develop 20 per cent. more power than any geared transmission.

WRITE FOR CATALOGUE
GIVING ALL DETAILS

Secure agency before too late. :-: Our product limited

WINDSOR AUTOMOBILE CO.
WINDSOR, INDIANA

Columbia

Gasoline Cars for 1906

ARE built of the best materials in the world under methods and processes more advanced than those employed in any automobile factory other than our own. No consideration of the cost of production has been permitted to interfere with making perfect every part and piece of each model, whether pertaining to mechanism, bodywork or general equipment. The expense of making the crankshafts, for instance, is six times greater than that of any previously made in this country. We guarantee that these cars, each according to its power and place, will yield the greatest things possible in motor service.

MARK XLVII 40-45 h. p. four-cylinder motor under forward bonnet; sliding gear transmission, four speeds and one reverse; jump spark ignition from storage battery; new pattern automatic carburetor; special chrome-nickel steel gears, axles, crankshaft and jackshaft; crankshaft machined cold out of solid block; double chain drive; I-beam front axle forged in one piece; pressed steel frame; 108-inch wheel base; seat starting; new pattern brakes. Price, with standard body $4,500
With 112-inch wheel base, Royal Victoria, Double Victoria, Limousine or Landaulet body .... $5,000 to $5,500

MARK XLVI An entirely new model. 24-28 h. p. four-cylinder vertical water-cooled motor; shaft drive, sliding gear transmission, three speeds and reverse; low tension make and break magneto current ignition; special chrome-nickel steel gears and shafts, crankshaft machined cold out of solid block; I-beam front axle forged in one piece; rotary pump oil lubrication; pressed steel frame, 98-inch wheel base; double side entrance body seating five passengers. Price $3,000

MARK XLIV-2 Perpetuating Mark XLIV, one of the most successful of medium-weight 1905 cars. 18 h. p. double opposed horizontal motor under forward bonnet; frame length increased eight inches, giving ample room forward of each seat; wheel base increased to 90 inches. Rear seat widened five inches; double side entrance body. An ideal family car, which will climb any hill and maintain a speed of 35 miles per hour on the level. Price $1,750

Columbia Electric Carriages

Victoria-Phaetons, Runabouts, Broughams, Landaulets
Hansoms, Surreys, Delivery Wagons, Trucks

Separate Catalogues of Columbia Gasoline Cars, Columbia Electric Carriages and Columbia Electric Commercial Vehicles will be sent on request

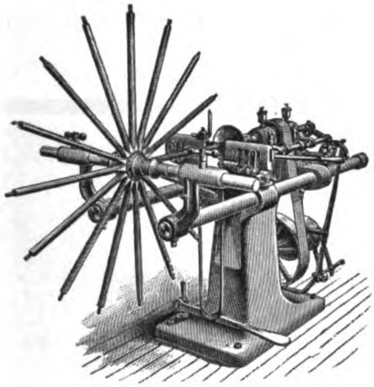
We shall exhibit at Madison Square Garden only January 13-20

ELECTRIC VEHICLE COMPANY, HARTFORD, CONN.

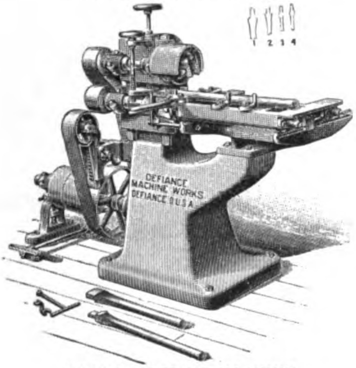
NEW YORK BRANCH: 134-136-138 West 39th St. CHICAGO BRANCH: 1332-1334 Michigan Ave. BOSTON: Columbia Motor Vehicle Co., 74-76-78 Stanhope St. PHILADELPHIA: Pennsylvania Electric Vehicle Co., 250 N. Broad St. WASHINGTON: Washington E. V. Transportation Co., 15th St. and Ohio Ave. PARIS: A. Bianchi, 194 Boulevard Malesherbes

Member Association of Licensed Automobile Manufacturers.

"DEFIANCE"



No. 1 WHEEL TENONER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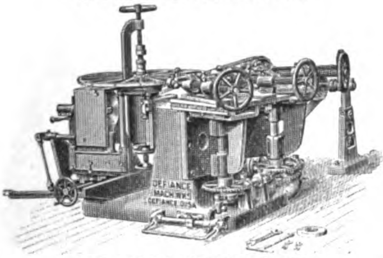
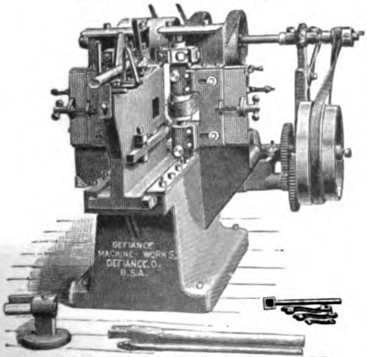
DEFIANCE MACHINE WORKS DEFIANCE U.S.A.

SPOKE MITERING MACHINE


DEFIANCE MACH WKS DEFIANCE U.S.A.

AUTOMATIC WHEEL RIMMER


DEFIANCE MACHINE WORKS DEFIANCE, O. U.S.A.

AUTOMATIC DOUBLE SPOKE FACER

High-Grade

Wood-Working Machinery

for making

Automobile Wheels

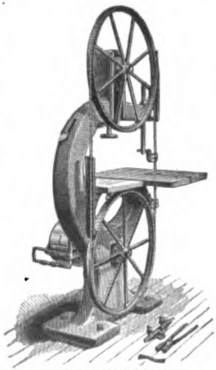
and

Bodies

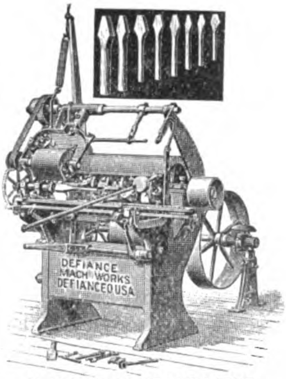
Complete Equipments of the Most Modern Tools

Invented and built by

THE DEFIANCE MACHINE WORKS
DEFIANCE, OHIO



36" BAND SAW


DEFIANCE MACH WORKS DEFIANCE O USA

AUTOMOBILE SPOKE LATHE

POPE
Waverley
ELECTRIC
AUTOMOBILES

PROFIT TO THE DEALER

The sales of **POPE-WAVERLEY ELECTRICS** last year increased 60 per cent. over the year before; and the past three months have increased 60 per cent. again over that. We are not the only ones who have increased sales, and we are glad, because it shows that the **Electric** is being appreciated by the public and by **some agents.** Are you among those agents who sell gasoline cars only? If so you are neglecting the most profitable part of your business. Many of our agents have told us that, had it not been for the **Electric** part of their business this year, they would have lost money. **The Electric is an all-the-year-round-carriage.**

Its sales are almost as great in the fall and winter as in the spring and summer. Are you neglecting a chance to make money at this season of the year? What you can make now is all velvet.

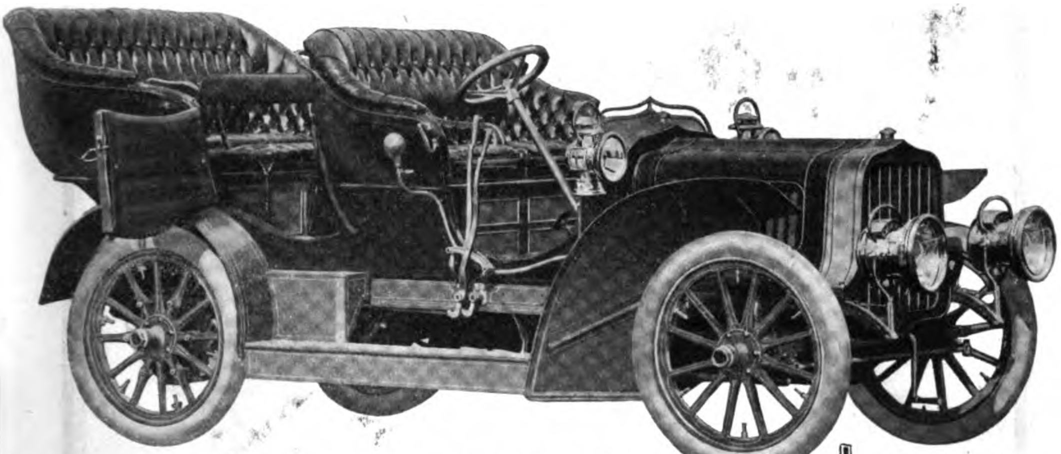
We exhibit in New York at
Madison Square Garden only

WAVERLEY DEPARTMENT **Pope Motor Car Company**

INDIANAPOLIS, IND.

NEW YORK CITY - - - 1733 Broadway
WASHINGTON, D. C. - - - 819 14th St.
BOSTON, MASS. - - 223 Columbus Ave.
SAN FRANCISCO, CAL. - 451 Mission St.

ONLY 54 LBS. OF WEIGHT PER HORSE POWER



35-40 H.P. Price Fully Equipped $3,500

POPE

This car is absolutely the most powerful, fastest touring car ever built. It will run from 5 to 60 miles an hour on the high gear. It will carry seven people at 30 miles an hour, and its noiseless, smooth running engine will be scarcely more exerted than when idling. Note this significant fact—The car has only 54 lbs. of total weight per horse power, only 10 8-10 lbs. of engine weight per horse power.

The Wheel Base is only 104 inches

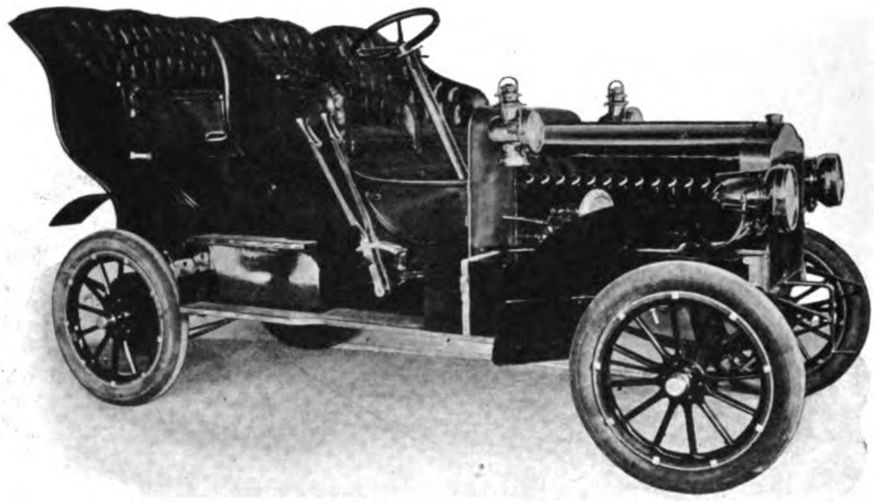
yet the car seats comfortably seven people with room to spare. DOUBLE DIRECT OUTSIDE CHAIN DRIVE of course; and a transmission made of a specially treated steel of 225,000 lbs. tensile strength—the strongest, most efficient, "sweetest" running transmission ever constructed. Send for Catalogue.

Be sure the name **POPE** is on your Automobile

POPE MOTOR CAR CO.
TOLEDO, OHIO
A. L. A. M.

AUTOMOBILES

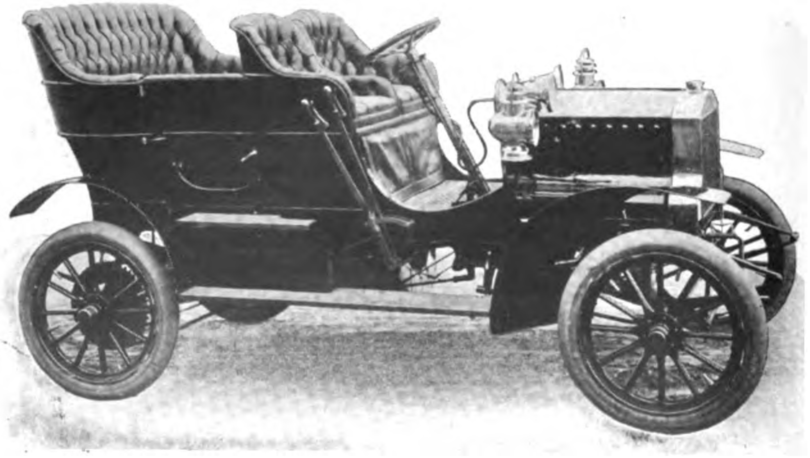
The Lambert



MODEL 8. PRICE, $3000

The Famous Friction Drive Car. A 1906 Machine Wonder

Has a four cylinder vertical water cooled motor, 4½x5. A range of speed from one to 55 miles per hour. 96-inch wheel base. 34x4½ inch tires, 14 inch road clearance. Price includes mats, five lamps, horn with foot bellows, and full tool equipment, also a Jones speedometer.



MODEL 5. PRICE, $1200

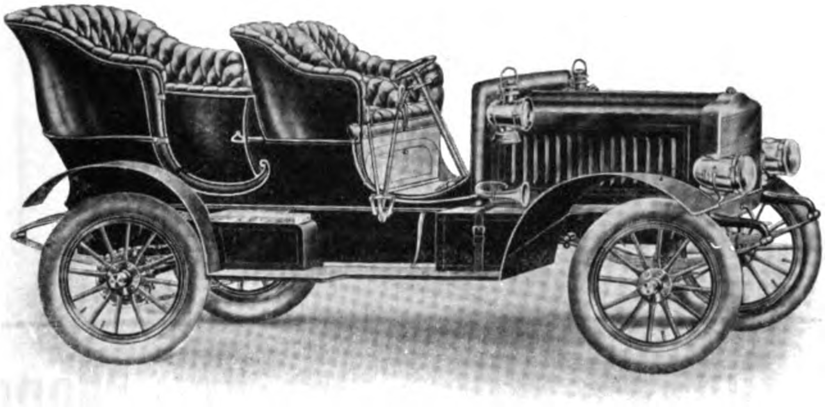
Equipped with a horizontal opposed motor 6x4. Any speed desired up to 25 miles per hour. 30x3½ tires, 18 inch road clearance. Price includes mats, 2 oil side lamps, horn and necessary tools. Write for illustrative catalogue.

THE BUCKEYE MFG. CO., Anderson, Indiana

Member A. M. C. M. A., Chicago

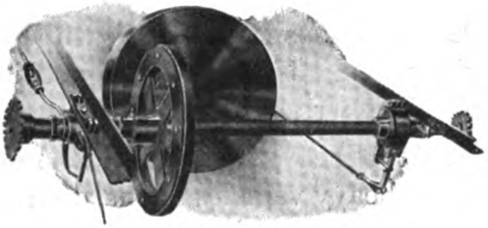
The Lambert

Guaranteed for One Year



Model 7. Price, $2000

This model is equipped with a 34 H. P. 4 cylinder motor, detachable tonneau, 32x4" tires, 14" road clearance. Price, includes mats, 5 lamps, horn and tool equipment, and is the best car on the market selling under $3000. Get a demonstration of this model before placing your order. **IT WILL PAY YOU.**



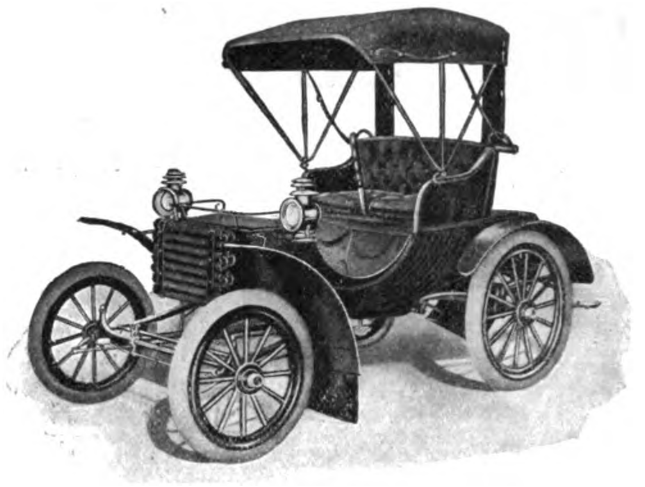
A Transmission without a cog wheel to break or get out of order.
NO GEARS TO STRIP

Get our specifications on trucks for light delivery. Write for 1906 Catalogue describing our line of six pleasure cars and two models in trucks.

The Buckeye Mfg. Co.

Anderson, Indiana

Member American Motor Car Manufacturers' Association, Chicago



A Duryea Will Save You Money

THE SIMPLE CONSTRUCTION, light weight, high power, large wheels and many superior features of the Duryea make it the best and cheapest automobile in the world. It is poor economy to buy other than the best.

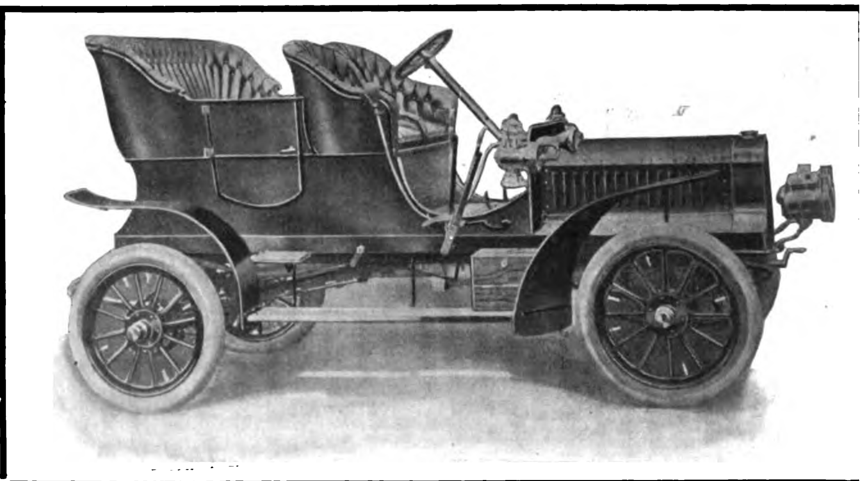
THE REASON WHY

There are many reasons for Duryea's superiority. We are always glad to give them. If you are "from Missouri and want to know," do not fail to write us.

You know that a heavy vehicle rides more comfortably than a light one, but heavy vehicles are hard on tires. **DURYEA** vehicles are light but carry all the weight on the large rear wheels. The passengers are therefore given the advantage of the weight and comfortable riding due to both the weight and the large wheels, while the large wheels save the tires. This is the right kind of a combination. It's the **DURYEA** kind.

Our leaflets give full information. See us at the Armory at New York and at the Coliseum, Chicago.

DURYEA POWER CO., **HOCKLEY ST.**
Reading, Pa.



'Iroquois'

4-CYLINDER TOURING CAR $2500.

SPECIFICATIONS.

TYPE "D."
WEIGHT, 2400 pounds.
H. P., 25-30.
WHEEL BASE, 100 inches.
TIRES, 32 x 4.
BRAKES, foot brake on drive shaft, and emergency brake on hubs.
GASOLINE CAPACITY, 18 gallons.
CLUTCH, expanding type. Simple and effective.
SHAFT, drive.
TRANSMISSION, sliding gear, three speeds forward and reverse.
BODY, side entrance, of beautiful design and proportion.
FINISH, olive green with black mouldings, and wine color chassis.
SEATING CAPACITY, five.
EQUIPMENT, includes two oil lamps; two oil side and one tail lamp; two gas lamps; long tube French horn; full set of tools; automobile clock, and water gauge on dash.
PRICE, $2,500. Canopy or folding tops, EXTRA.
TYPE "C." Detachable tonneau. Side entrance. H. P. 18-20. Price. $2,000.

The 1906 **IROQUOIS** is an evolution in automobile development noted for quality, strength, mechanical excellence and low cost of maintenance.

The "**IROQUOIS**" are automobiles of rare merit and acknowledged reputation. They are the result of years of painstaking effort intelligently directed, and are built for traveling over all sorts of roads without requiring many repairs or adjustments throughout the season. A car that can travel at 40 miles an hour, but will run quietly at any speed. Strong, simple construction with handsome durable finish.

Reliable agents wanted. For further particulars write at once to the

IROQUOIS MOTOR CAR CO.,

Seneca Falls, N. Y., U. S. A.

We exhibit at the 69th Regiment Armory, N. Y. City. Expert inspection desired. Prompt shipment after February 15th.

Pleasure Cars

WATCH FOR PICTURES NEXT MONTH

THE LITTLE TOURING CAR

Seven H. P. delivered at the tires; guaranteed.

Speed 30 to 35 miles an hour.

Motor easily accessible and vibration entirely eliminated.

Planetary gear giving two speeds and reverse and with clutches specially designed to work when covered with oil.

Foot control of speeds, interlocking and automatically releasing.

TOWN CAR

Speed 18 to 20 miles an hour. 10 horse power.

Luxuriously finished Landaulet or Limousine body.

Designed especially with the view of supplying those desiring a thoroughly well built car running at a moderate rate and entirely obviating the possibility of unsafe speeds within city limits.

25 H. P. TOURING CAR

Speed about 40 miles an hour.

Transmission optional; planetary gear transmission or sliding gear giving three speeds forward and reverse.

Automatic governor giving a continuous unvarying speed both uphill and down, and easily set at any speed desired.

Bevel gear drive direct connected to the motor on high speed.

Motor placed in dust-proof compartment.

Air from cooler thrown down beneath car and not carried with its dust and heat over the motor.

Open crank case motor giving easy accessibility to the pistons, connecting rods, crank shaft and all bearings.

HEWITT MOTOR CO.

6-8-10 East 31st Street NEW YORK CITY

Members Association Licensed Auto Manufacturers

See our Two Exhibits at the Madison Square Exhibition

Commercial Cars

WATCH FOR PICTURES NEXT MONTH

LIGHT DELIVERY

Built with the especial view of being operated by an inexperienced driver.

Planetary gear transmission two speeds forward and reverse.

Automatic locking and release foot control permitting only one speed to be in operation at a time and automatically release of speeds with the application of the brake.

Capacity 1500 pounds; maximum speed 18 miles an hour, surmounting the steepest grades without difficulty and altogether as "FOOL-PROOF" a machine as it is possible to build.

MOTOR TRUCK

Four-cylinder 25-H. P. gasoline motor.

Capacity three tons.

Speed 10 to 12 miles an hour.

Planetary or sliding gear transmission with chain drive to the rear wheels.

Front tires 36 x 6, two tires on each wheel like the only successful foreign practice.

Built throughout of the highest grade of materials obtainable and the best possible class of workmanship.

Foolish adjustments by the driver prevented by enclosing the motor in a locked steel compartment.

Only truck having pressed steel frame.

EACH AND EVERY TYPE HAVING

High compression.

Mechanical inlet and exhaust valves.

Continuous positive pressure oil feed starting and stopping with the motor.

A really automatic carburetor, high tension coil ignition; low tension magneto ignition.

Generous toggle expanding brakes—dust proof.

All gears and shafts of imported German steel, case-hardened and ground.

Timken roller bearings.

Michelin tires—enough said.

OUR OWN SPECIALS

Platinum iridium contact points.

Automatic carburetors.

Positive continuous pressure oil pumps.

Magnetos built specially to our specifications.

Planetary gear transmissions: durability guaranteed.

High pressure bearing babbit of unequalled quality.

HEWITT MOTOR CO.

6-8-10 East 31st Street NEW YORK CITY

Members Association Licensed Auto Manufacturers

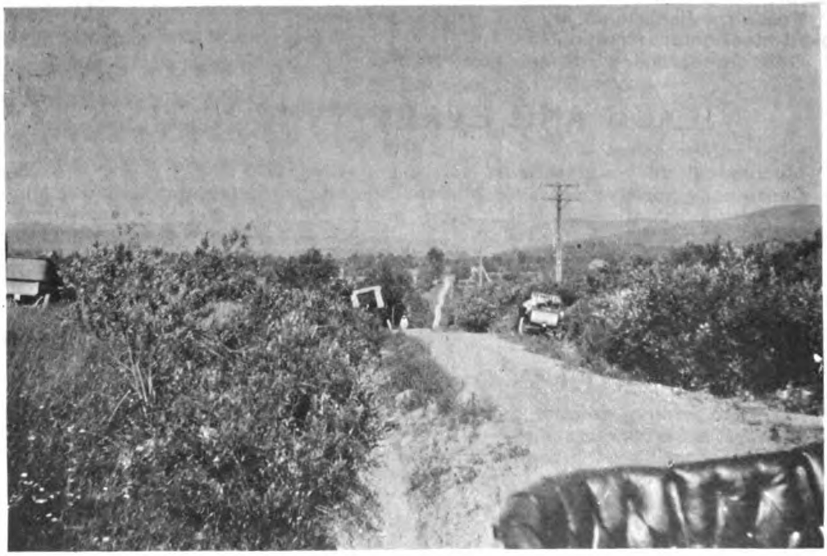
See our Two Exhibits at the Madison Square Exhibition

BERKSHIRE AUTOMOBILES

HIGH CLASS TOURING CARS

MADE AND TESTED IN THE BERKSHIRE HILLS

THE entire output of the Berkshire Automobile Co., of Pittsfield, Mass., is controlled by the Douglas-Andrews Company, 1623 Broadway, New York, and will be handled direct to the customer. No agencies will be placed.



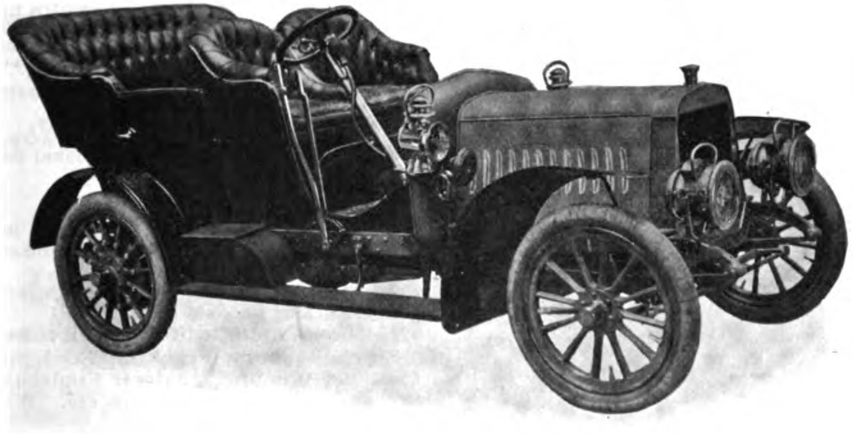
ONE OF THE BERKSHIRE HILLS

DOUGLAS-ANDREWS COMPANY
SELLING AGENTS
1623 BROADWAY NEW YORK

BERKSHIRE AUTOMOBILES

HIGH CLASS TOURING CARS

MADE AND TESTED IN THE BERKSHIRE HILLS



16 H. P. $2,000

25 H. P. $2,500

40 H. P. $4,500

WILL BE SEEN AT THE

AUTOMOBILE CLUB OF AMERICA SHOW

69TH REGIMENT ARMORY

NEW YORK

DOUGLAS ANDREWS COMPANY

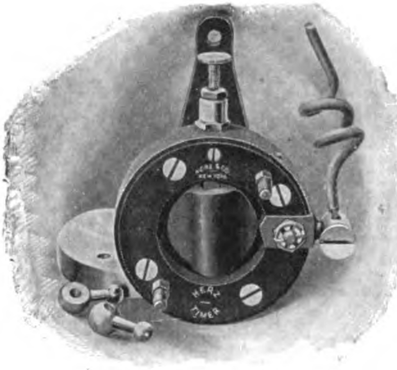
SELLING AGENTS

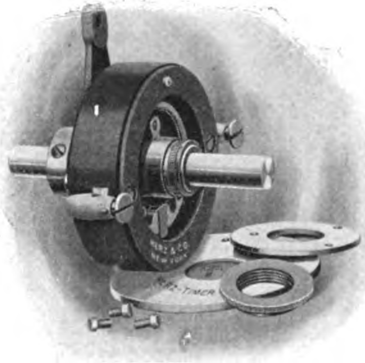
1623 BROADWAY NEW YORK

THE WISE MANUFACTURER Spends less for advertising and puts better value in his car

Here's Testimony:

HERZ TIMER





Mr. CALVIN PAGE writes concerning the HERZ TIMER:

July 28, '05

MESSRS. HERZ & CO., New York City.

DEAR SIRS:—I am pleased to acknowledge receipt of your HERZ TIMER. It is the ***best investment I ever made***, and I would not take any amount for it, if I could not obtain another. It goes ***far beyond my expectations, and I should not think that I was riding in the same machine as before.*** I wish every automobile owner who is suffering from a poor commutator could know about it.

On Wednesday I was "skipping" about the country with trouble with my old commutator, which required cleaning every ten miles and consumed as much as a gallon of gasoline for every five miles. Now I am driving FOUR times the distance with the same amount of gasoline, so that ***I will save this season on gasoline alone many times the amount of the check I sent you.***

It does not seem possible that there should be such a difference in sparktimers.

Yours very respectfully,
CALVIN PAGE,
President New Hampshire National Bank
Portsmouth, N. H.

Our fifteen years of experience have proved the snap-off contact to be the only permanently successful contact.

Toolsteel vs. Toolsteel. Running packed in grease; sticking vibrators IMPOSSIBLE.

17 different models to fit ANY MAKE of motor.

Special types for Franklin, Ford, Olds, Cadillac, Winton, Peerless, Studebaker, Stevens-Duryea, Reo, Glide, etc. We fit any motor.

GUENET COILS

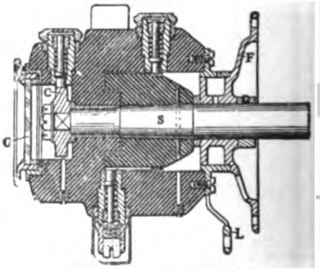
With Carpentier Interrupter.

Sticking impossible. New prices :

1 cyl. . . .	.16
2 cyl. . . .	.29
3 cyl. . . .	.48
4 cyl. . . .	.59

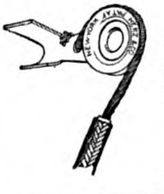
The Acme of perfection.

The Cream of the French Market.



HERZ DISTRIBUTOR

One coil for all cylinders. It sits on the dashboard before your eyes. Double base swivel support. Primary contact under plate glass cover. Snap off contacts. Spring connections throughout.


NEW YORK HERZ & CO.

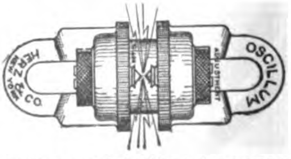
WIRE TERMINALS

With groove. **No soldering.** Intimate everlasting contact. Write for prices.

Detachable Cable Terminals

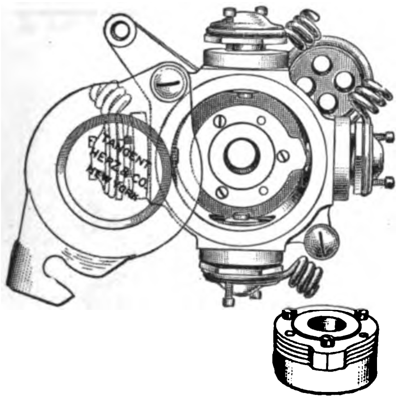
Three Sizes—3/8, 1/2, 5/8

Assorted Boxes **60c. Box**



Oscillum Spark Intensifier makes every spark plug spark no matter how snooted All metal and glass, unbreakable. PRICE, $1.00

A Blind Man Can See the Superiority of the HERZ-TIMER



over any other circuit breaker on the market. We have now 17 different Models adapted to the various motor constructions. **"Tangent"** is the LATEST Model; all contacts are individually adjustable, according to the different compressions in the cylinders of multicylinder engines.

The body is aluminum. Contacts laminated (patented).

NO BEARING. NO WEAR.

The principles are always

TOOLSTEEL vs. TOOLSTEEL

Snap off contacts. The quick break of the contact preventing sticking vibrators no matter what coil is used. We have thousands of testimonials from all parts of the world.

A Declaration of War against Bad Ignition

We will improve and increase the spark in the motor by 100 per cent. read: **One hundred per cent.** by application of our new patented **Steel Armored Ignition Cables and Wire** approved of and adopted by the most prominent automobile factories in France and Germany. Furnished only in complete wiring outfits with all terminals.

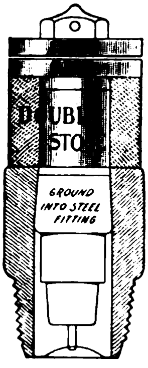
"Puck"

HERZ'S PATENT
Safety Switch

A switch with its contacts, under dust proof and water proof engraved metal cover; exclusive design; most elaborate workmanship imaginable.

NOTHING on the market to compare with it

Bougie Mercedes



Absolutely the best spark plug made. Absolutely self cleaning. DOUBLE STONE. Will never crack. Guaranteed for 6 months.

Write for testimonials.

Some people use them for 2 years without taking them out of engine.

The greatest value ever offered.

Price, $2

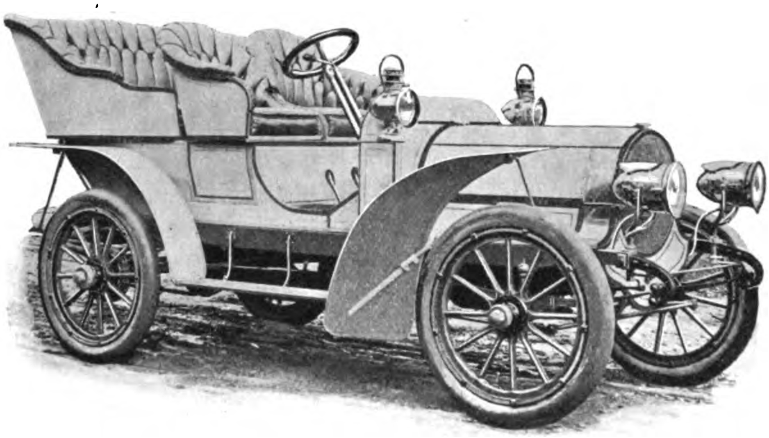
The Largest Makers of High Grade Ignition Material in America.

HERZ & CO.,

CIVIL ENGINEERS
Write for the newest catalogue. Do it now!

187 Elm St., New York

Starts from the Seat
No Crank Necessary
A Foot Lever Does It



DUQUESNE

4 CYLINDER 4 CYCLE 16-21 HORSE POWER

SIMPLICITY must be the watchword of automobile builders wishing to construct a car that will stand the test.

Air-cooling is the simple way, because it does away with water tank, water pipes, radiators and pump; lightens the load on the tires and eliminates freezing in cold weather.

The Duquesne is not a racing car. It was designed especially to stand hard usage. Will take the ordinary country roads at from five to twenty-five miles an hour with five passengers. Will climb ordinary hills on high speed and any hill on low speed, and on paved streets and level roads will do forty miles an hour.

Direct drive with vital parts encased and running in a bath of oil is superior to the chain system with "sand shower" lubrication.

Starting the engine with a foot lever is better than the old style of "cranking."

The Duquesne motor is air-cooled; requires no cranking; starts from the seat by a foot lever—a lady can start it.

Weight, 1750 Pounds **Price, $2000**

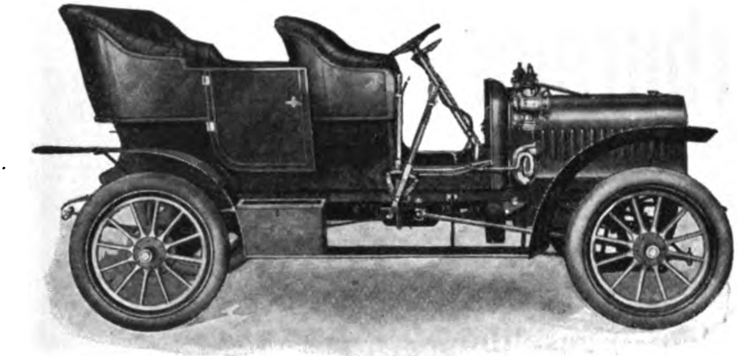
We are offering a very attractive agency proposition. Write.

Duquesne Construction Co.

JAMESTOWN, N. Y.

MOLINE

1906 **1906**



MODEL "C" 18-20 Horse Power Light Touring Car $1750.00

Four cylinder vertical water cooled motor under hood in front. Pressed steel frame, three speed sliding gear transmission, Mechanical oiler, Jump spark ignition with 60 ampere storage cell.

Wheel base, 100"; Tires, 32"x3½". Shaft drive to bevel gear in rear axle.

Double side entrance body, strictly up to date in every particular.

MODEL "A" 30-43 Horse Power Touring Car $2500.00

Same general lines as Model "C," but larger in every way.

Wheel base, 100"; Tires, 34"x4". Exceedingly large and roomy side entrance tonneau with all appointments as fine as can be produced.

MODEL "G" 16 Horse Power Touring Runabout $1000.00

Double cylinder horizontal opposed motor under the body of new and very satisfactory design.

Ample bearing surfaces, plenty of radiation surfaces, new style of circulating pump, all spur gear planetary transmission, roller chain drive.

Side entrance detachable tonneau body of very pleasing lines, Mechanical Oiler.

Wheel base, 86"; 30" wheels. A thoroughly substantial rig for common-sense people.

A special feature is made of having cylinders, pistons and rings actually ground to a standard gauge, thus making all parts interchangeable.

Another feature of the factory work is the extended use of jigs for drilling cylinders, crank cases, transmission cases, etc., so that repairs which will fit can be promptly furnished when needed.

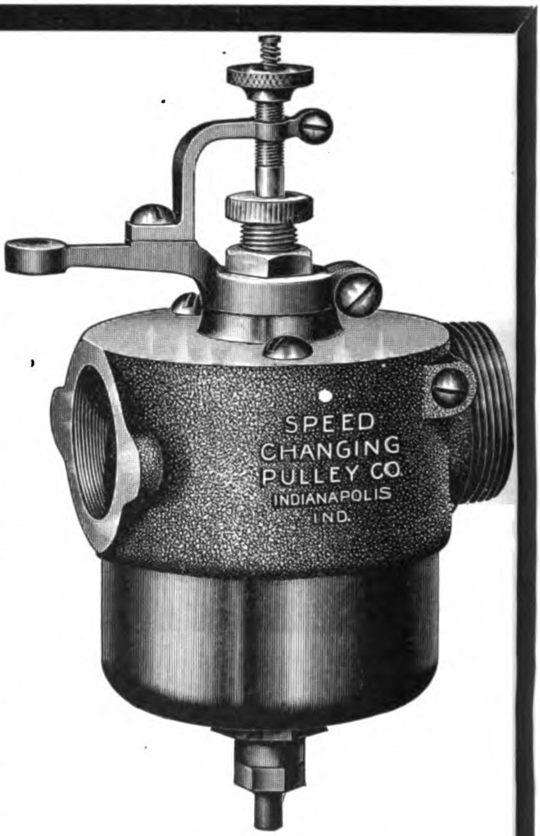
Will exhibit at Armory Show in New York, January 13th to 20th, also Coliseum Show in Chicago, February 3d to 10th.

Moline Automobile Company

EAST MOLINE, ILLINOIS

Automobile Exchange & Storage Co., 133-39 West 38th St., New York City.
C. H. Saunders, Motor Mart, Boston, Mass.

...THE...
Universal Carburetor



Is sold under a positive guarantee to increase the efficiency of the engine. Travel more miles with less consumption of gasoline than any carburetor on the market. Also to supply a uniform mixture at all engine speeds. :: :: ::

DISTINCT FEATURES

No needle valves to get out of fix.

No flooding to cause waste or bother.

No matter what position the car may be in, there is always a perfect level of gasoline at the spray nozzle. If you desire to get the best possible results from your engine the "UNIVERSAL" will certainly do the business.

Orders, large or small, filled with accuracy and dispatch.

Our booklet is yours for the asking. It tells all about it, also what users have to say about it

SPEED CHANGING PULLEY CO.
Indianapolis, Indiana

WE EXHIBIT AT CHICAGO

Mr. Automobile Manufacturer

DON'T EXPERIMENT—IT COSTS DOLLARS

But investigate, before contracting for your
1906 Engines, the merits of the...

CARRICO

18-20 Horse Power 4 Cylinder
4 Cycle Air Cooled Engine

The CARRICO Engine will have all the latest and best ideas of the designer, F. D. CARRICO, who has nine years' experience in the building and designing of successful engines and automobiles, and has to his credit two of the most perfect air cooled engines being built to-day. The CARRICO Engine is his latest creation and will be built as nearly perfect as modern grinding machines and special tools and jigs can make it.

The CARRICO Engine is the Three Hundred and Sixty-Five Day Engine

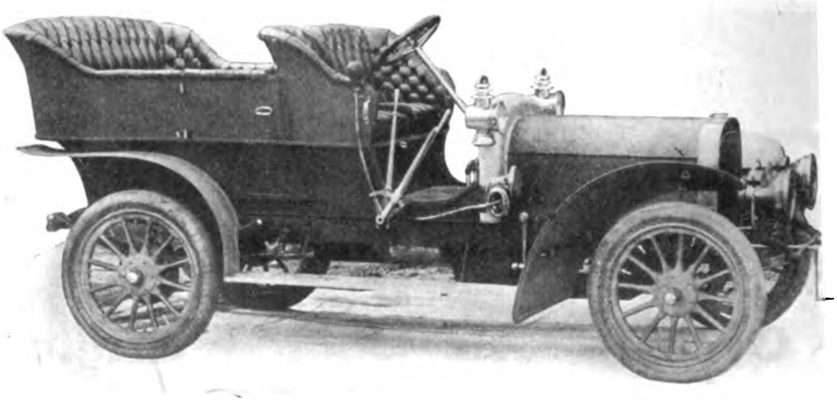
Will Not Over Heat or Freeze
Always Ready to Deliver its Rated Horse Power

We will contract for the delivery this season of a limited number of CARRICO Engines.
We will have our engine at our space No. **A-62 1st Regiment Armory Building, at Chicago,** and will have a demonstrating car in commission at our plant.

SPEED CHANGING PULLEY CO.
Indianapolis, Indiana

HAYNES

TWO MODELS ONLY FOR 1906



Model "R"—Four Cylinder Touring Car

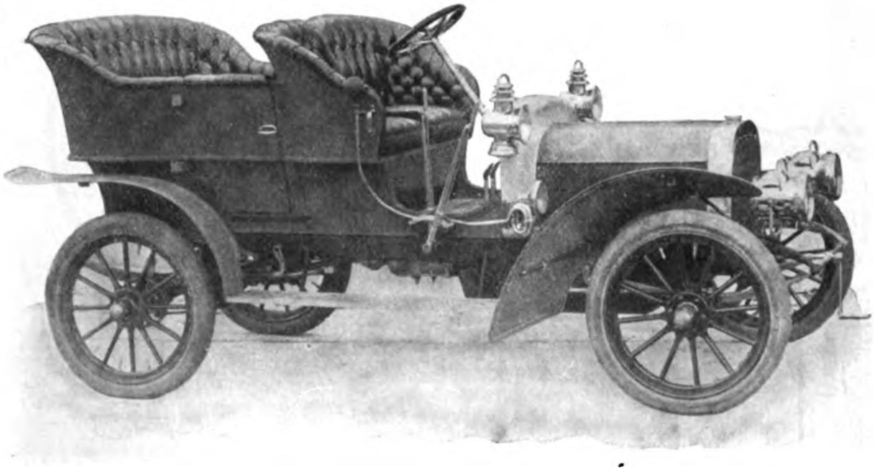
Roller bearing, vertical engines, cylinders 5¼ in. bore x 6 in. stroke, cast separately; 50 H. P. sliding gear transmission with exclusive device. which prevents possibility of burring or stripping gears, and permits instant change from high to lower speeds with perfect safety and without noise. Positive cooling system operated at very low cost of power. Individual and special lubricators. Carburetor which assures perfect mixture in all temperatures and under all climatic conditions. Master clutch that has no leather surfaces to wear. Takes hold easily and gradually without noise or jerk. Shaft drive. Exclusive universal joints that do away with wear on pins; runs in grease-packed housing. One piece nickel steel rear axle with beveled sprocket gear, driven by roller pinion; thrust eliminated, friction reduced, noiseless, all in a bath of oil. Roller bearings throughout. 108 in. wheel base, 50 in. tonneau with ample room for two folding chairs. Six to sixty miles an hour on high gear. 34 in. wheels, 4½ in. tires. Weight 2,750 lbs. Price, $3500.00 f. o. b. Kokomo. Full head and tail light equipment. Horn and tools.

One each of our 1906 stock cars—Models "O" and "R"—were driven from Kokomo to New York and Boston and return, with numerous side trips, a distance of almost 6,000 miles, without any difficulty whatever with either engines, transmission or other parts. The rear axle and roller pinion, against which all the strain of shaft driven cars is thrown, shows absolutely no wear to either, although a great portion of the trip was made through sand and mud and over many hills. The model "R" car crossed the Allegheny Mountains via the National Pike, one of the most difficult roads for automobiling in America. The route was selected with the special intention of giving the cars as severe test as possible, and they stood up under conditions that will not be ordinarily required of them.

Every important feature of the 1906 **HAYNES**—roller bearing engines, master clutch, transmission, universal joints, rear axle, sprocket and roller pinion, is exclusive with, and found only on the **HAYNES**.

Every detail has been developed in the **HAYNES** factory, with exact reference to every other part. There is perfect harmony throughout the entire mechanism, which is the reason that there is less than 10 per cent. loss of power between the engine and rear wheels. It is the reason that its cost of maintenance, upkeep and operation is so remarkably low, and that for 14 years the **HAYNES** car has had the unquestioned reputation of being a car of pre-eminently high quality.

HAYNES



Model "O"—Four Cylinders—Cast in Pairs

Model "O" is very similar to Model "R" in design and appearance; the main points of difference being as follows:—Cylinders cast in pairs; 4¼ in. x 5 in.; 28-30 H. P. Wheel base 97 in., 32 in. wheels, 4 in. tires. Speed four to forty miles an hour, on high speed. Room for five passengers. Same body design as Model "R" and contains all other exclusive HAYNES features.

Price, $2250.00 f. o. b.; Kokomo.

The cylinders of the **HAYNES** engines are extra large, and the power they develop is far in excess of the rating we give them. They are made of metal exclusive with ourselves, admitting of exact grinding and perfect compression.

The transmission of the **HAYNES** never allows the momentum of the fast moving car to be thrown against the power of the engine with its consequent strain to the entire mechanism, frame and tires; a fault common to all other types of transmission. There is no danger of stripping gears, or of gears climbing out of casing, which constitutes the chief objection offered to large shaft driven cars.

Roller bearings used throughout, give noiseless operation. Large flexible springs insure riding ease, and long life to tires. Simplicity of control, all parts immediately accessible.

The 1906 **HAYNES** body was designed by the leading body maker of Paris. No detail that tends to luxurious comfort, quietness or convenience is lacking. The **HAYNES** is honestly built. The body is of cast aluminum and wood. Grey curled hair and hand buffed leather used in upholstering. All materials are tested for strength and flexibility at double the severest road requirements, and the car must prove its power on a road test before leaving the factory.

These are some reasons why the **HAYNES** gives such satisfactory service at a low cost for upkeep. Others are given in our new catalog, which will be sent upon request. For prompt attention, address

The Haynes Automobile Co.

KOKOMO, INDIANA

Chicago, 1420 Michigan Ave. New York, 1715 Broadway. Members A. L. A. M.

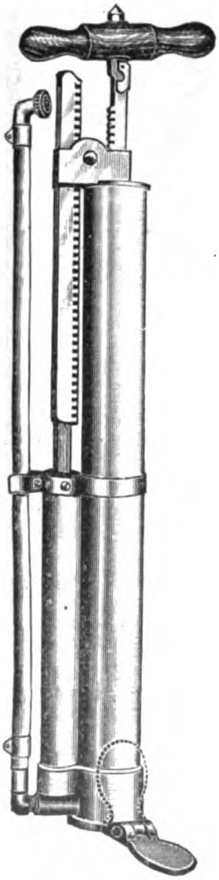
WRAY PUMP and

A LINE OF TIRE INFLATORS

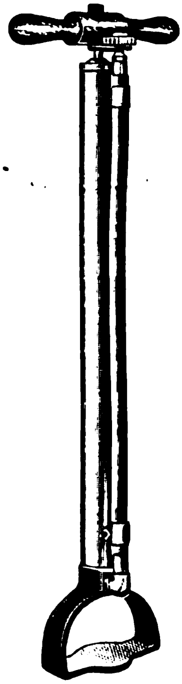
NEW YORK OFFICE
103 Reade Street

CHICAGO OFFICE
85 Lake Street

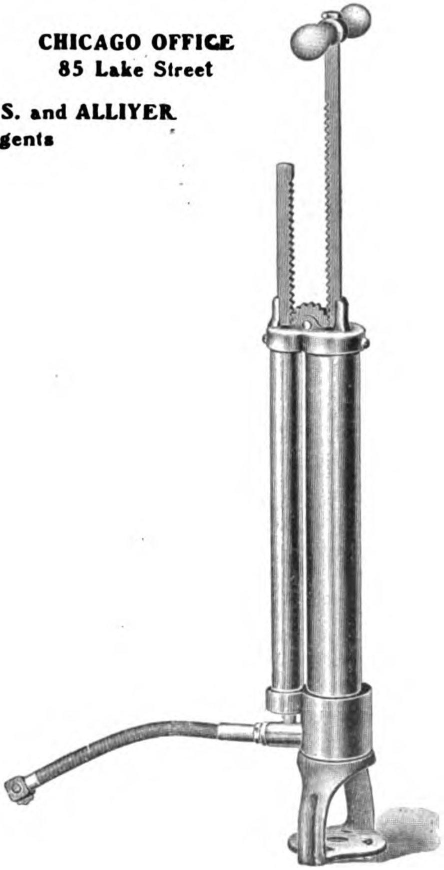
BRANDENBURY BROS. and ALLIYER
Selling Agents



No. 2
Compound



No. 6
Single Action

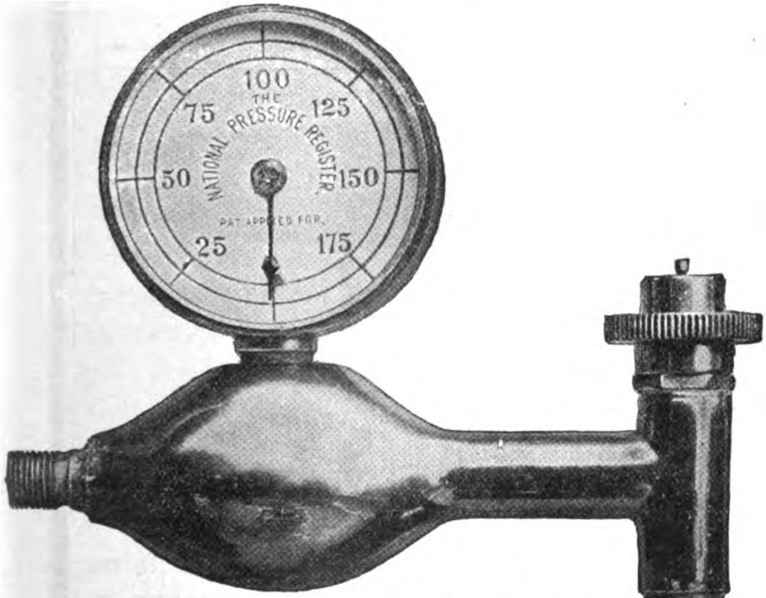


No. 1
Multiple Gear

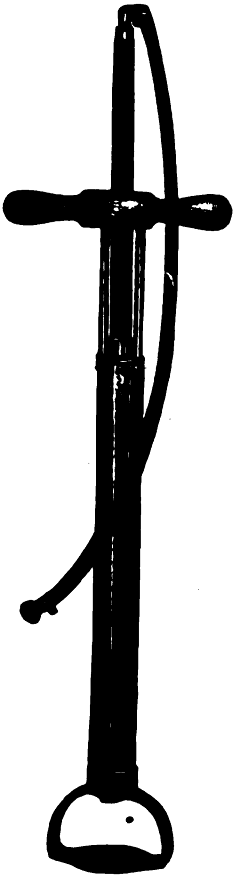
ROCHESTER,

REGISTER Co.

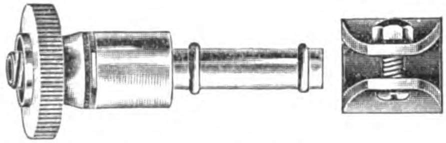
THAT CANNOT BE EQUALED


100
THE
NATIONAL PRESSURE REGISTER
75
125
50
150
25
175
PAT. APPLIED FOR.

No. 3. National Pressure Register



No. 4. Compound Collapsible



No. 9 Ezy Coupling

No. 10 **Registering Compound**

COMPLETE CATALOG on application

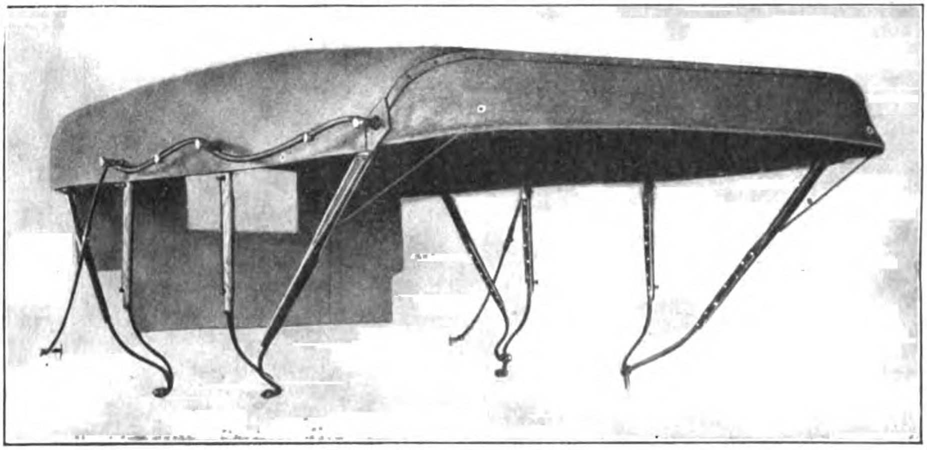
NEW YORK, U.S.A.

THE SPRAGUE IDEA

The Sprague Tops

MADE THE SPRAGUE WAY

The Guaranteed Tops



They are right **They work right**

They stay right for one year, or we make them right.

The Sprague tops and fronts are made from blue prints by experts, every part is the best that can be made. We make the whole thing. **If it's a Sprague top it's right in every particular.**

You possibly can afford to buy a top before seeing the **Sprague Top.** You may have to do so, but if you can, get a **Sprague top.** You will not be disappointed. See our display at both the New York shows; also at the Chicago show.

Ask for our catalogue.

THE SPRAGUE UMBRELLA CO.

NORWALK, O.

Sole makers of the **Sprague top;** made the **Sprague way**

The Guaranteed Tops

COL. SPRAGUE'S AUTO TOPS

The Sprague Idea

Made the Sprague Way

We are harder to please than our customers are, when it comes to making tops. We are interested in the success of thousands of tops. The customer is interested in only one top, or a few hundred at the utmost. The delight and real satisfaction of owning a top is always in equal proportion to the way the top will wear and how it will stand the hard usage it must be put to.

A Sprague top is made right—of the best obtainable material, **strong and durable**—its superb workmanship is always in evidence. They always look right, and the proportions are correct.

A Sprague top has that air of elegance and respectability, that well-bred appearance, that gives it a tone of refinement not to be found in others.

When you are on the road with a **Sprague top** you will not meet anyone with anywhere near as good a top, unless the party is fortunate enough to have a **Sprague top.**

There may not be any actually poor tops, but some are better than others. **A Sprague top is the better kind.**

The Sprague Umbrella Co.

NORWALK, O.

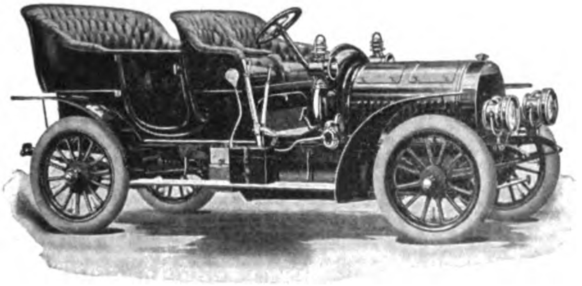
Sole makers of the Sprague tops, made the Sprague way.

Send for Catalogue.

ROYAL TOURIST

POINTS

Runs quietly. Costs less for repairs than any motor car built anywhere. Steers easily. Perfect control of motor. Certainly is fast. Is built with care.



We have a full description of 1906 models ready to mail to you if you will send us your address. Will also mail booklet explaining performance of '06 model in Vanderbilt Trial Race.

The Royal Motor Car Co.

CLEVELAND, OHIO

AGENTS: C. A. Duerr & Co., New York, N. Y. G. J. Dunham, Boston. Mass. The McDuffee Automobile Co., Chicago, Ill. G. W. Caplin, Minneapolis, Minn. Automobile Supply Co., Lim., Toronto. Motor Shop, Philadelphia, Pa. Westminster Automobile Co., St. Louis, Mo. Standard Automobile Co., Pittsburg, Pa. Amos Pierce & Co., Syracuse, N. Y. Thompson Schoeffel Co., Rochester, N. Y. Member A. L. A. M.

ASK ANY OWNER OF
A ROYAL TOURIST

THIS LETTER IS A MILD SAMPLE

Toronto, December 2, 1905

Royal Motor Car Co.,
Cleveland, Ohio.

Gentlemen:—

My family are not particularly fond of driving in the cold weather, and I have, therefore, laid up my car until spring. As I had the honor of signing the first Canadian order for a Royal Tourist, thought you would be interested in what I thought of the machine after one season's experience, and have only to repeat what Prince Louis, of Battenberg, had to say when traveling in the machine, "a wonderful car, good enough for any man living." Quite a number of your cars have come to Toronto, and the above few words express the opinion, I think of all the owners.

Wishing you the success that your machine should bring, I am,

Yours truly,
WM. J. SMITH.

ROYAL

The Royal Motor Car Company
Cleveland, Ohio

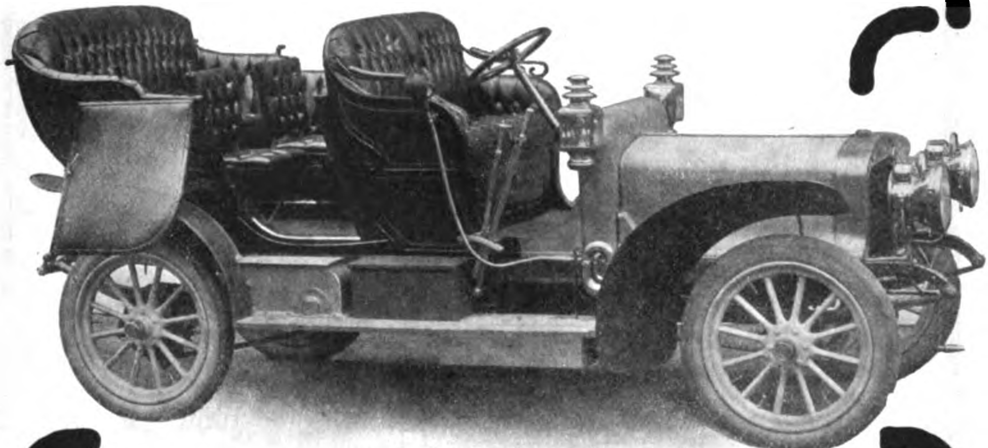
To try an Acme is to buy an Acme

Acme Motor Cars

prove on actual, practical road demonstration every essential feature of advanced and perfected automobile engineering to-day:

The Acme claims of superiority are based on these cardinal points:

- **Highest Efficiency**
- **Ease of Control**
- **Smooth, Quiet Running**
- **Highest Power in Proportion to Weight**
- **Strength and Compactness**
- **Beauty of Design**



Guaranteed for 365 Days

Acme Motor Cars are built entirely and wholly by the Acme Motor Car Company, which means there are no bought parts for assembling—**no unknown quantities.**

1906 ACME CARS

SPECIFICATIONS - - TYPE XV

Price	**$3500.** Complete with two side Oil Lights, two Acetylene Head Lights and Generator, Tail Light and Horn.
Type	Touring Car.
Seating Capacity	7 persons.
Weight	2600 lbs.
Wheel Base	114 inches.
Tread	56 inches.
Clearance	10 inches.
Body	Double Side Entrance Tonneau, divided Front Seats, made of best seasoned Ash, Poplar and Basswood.
Seats	Soft Edged, Spring Cushioned Seats and Backs width, front, 19 in., depth, 18 in., width, rear, 52 in , depth. 18 in.
Leather	Best Quality, Hand Buffed, Pebble Grained, French Finished.
Frame	Cold Rolled Nickel Steel, 180,000 lbs. tensile strength.
Axles	Front Nickel Steel, drop forged, "I" Beam Spring Seats integrel with Axle; rear 1½ in. square, Nickel Steel forged.
Clutch	Multiple Disc, running in oil, self-contained, no end thrust on bearings.
Transmission	Practically indestructible, Selective Sliding Gear, direct drive on 3rd speed.
Speeds	4 speeds forward and one reverse on one lever.
Gears	Chrome Nickel Steel, oil tempered, 212,000 lbs. tensile strength.
Bearings	Annular Ball, full type non-adjusting, Lemoine pattern.
Sprag	Internal Rachet in Sprocket of each Wheel.
Bolts and Nuts	All Bolts and Nuts throughout car, case hardened, and locked with Spring Lock Washers and Cotter Pins
Gearing	Speed of Engine, 1000 R. P. M. 20-32 T. Sprokets.

TYPE XIV - - $2750

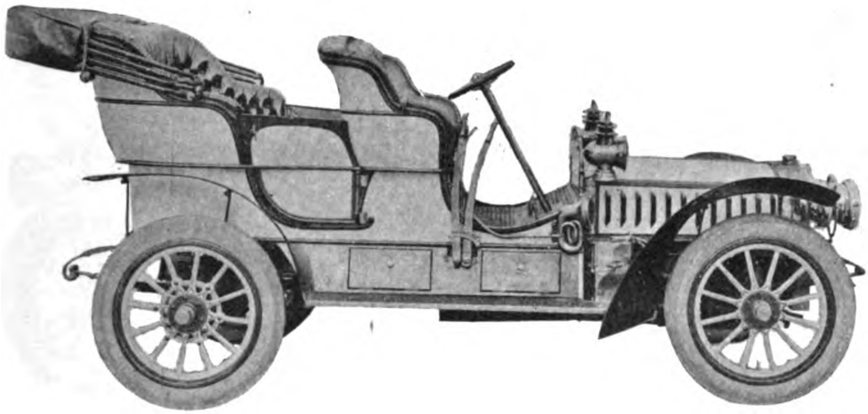
Of the same practical construction as type XV. Greatly improved in arrangement and larger body than last year.

Speed	Gear Ratio	Miles per hour
3rd DIRECT DRIVE	2.88	35.1
2nd	5.22	19.4
1st	9.98	10.1
Reverse	12 64	8.0

DEMONSTRATION OF TYPE XV OR TYPE XIV BY APPOINTMENT

ACME MOTOR CAR CO. - Reading, Pa.

PHILADELPHIA BRANCH, 1385 ARCH STREET



60 H. P. AUSTIN 1906 MODEL

EXCLUSIVE

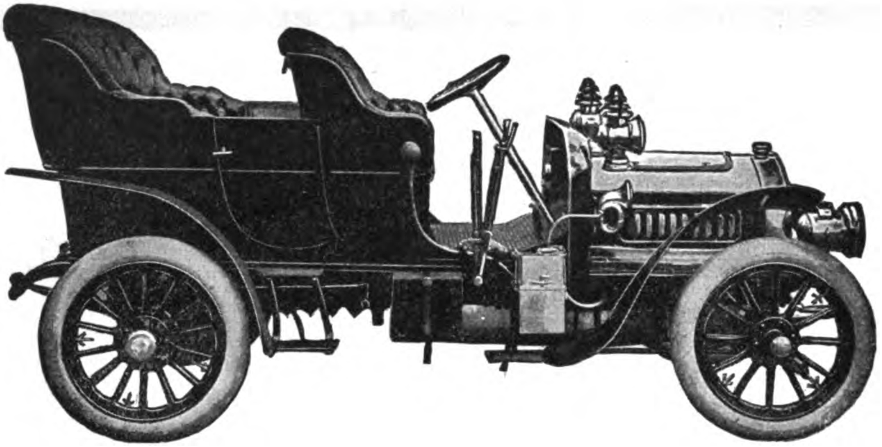
AUSTIN

FEATURES

New complete DOUBLE IGNITION system, improved (patented) sliding gear transmission (selective type), FOUR FORWARD SPEEDS with new (patented) method of operation, new (patented) SPRING CONTROLLER absorbing recoil. A BEAUTIFUL and exceptionally well built car, STRONG in every part. Write for full particulars.

AUSTIN AUTOMOBILE CO.

GRAND RAPIDS, MICH.



NOT a racing auto—but it has great speed.

NOT an auto for show alone — but no machine made has greater beauty or style.

IT IS an auto for motoring; an ideal all around touring car with a perfect ignition system, combining dynamo and storage batteries; a positive pressure oiler that assures regular lubrication; a rear axle device that relieves the driving axle of the machine's weight.

Lightness and speed, strength, comfort and style, and back of these the name that stands for reliability—

STUDEBAKER

THE 4-CYLINDER GASOLINE CAR FOR 1906

SEND FOR CATALOGUE

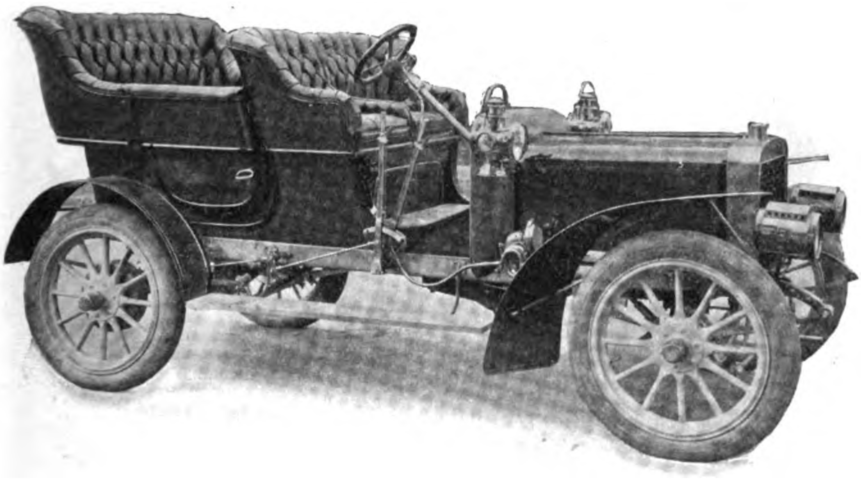
STUDEBAKER AUTOMOBILE CO.
SOUTH BEND, INDIANA

Member Association Licensed Automobile Manufacturers

REPOSITORIES

New York City, Broadway and 7th Ave., at 48th St.
Denver, Col., cor. 15th and Blake Sts.
Chicago, Ill., 378-388 Wabash Ave.
Salt Lake City, Utah, 157-159 State St.
Kansas City, Mo., 810-814 Walnut St.
Portland, Ore., 330-336 E. Morrison St.
San Francisco, Cal., cor. Market and 10th Sts.
Dallas, Texas 317-319 Elm St.

Agencies in all Principal Cities.



The Dorris Car

THE Dorris Motor Car Co., announces the completion of their 1906 Model "DORRIS" Touring Car. While the name of the company is new to the motor world, the name of Mr. G. P. Dorris is not, he being one of the pioneers of the motor age. Mr. Dorris, who is our Vice President and General Manager, has devoted the past ten years to perfecting the automobile, having occupied a similar position with a well known motor car company.

With this experience it has been possible to choose only such individual parts as have withstood the test of time. We have produced a leading type of car in its every detail, which combines a high degree of harmony, efficiency and long life. We have deliberately chosen every detail; our factory is new and is equipped with the very latest of approved machinery and tools, which enables us to offer the best VALUE for the money.

Price. $2500; ready for the road.
Lamps. Five.
Horse Power. 30.
Motor. 4 cylinder, 4¼ x 5.
Valves. In head, interchangeable.
Cylinders. Twin, ground.
Clutch. Multiple disc.
Frame. Pressed steel.
Fly Wheel. 22″ with fan.
Wheel Base. 101 inches.
Pump. Gear driven.
Springs. Front semi-eliptic, rear platform.
Radiator. Finnel tube.
Steering Gear. Rack and pinion,
Control. On steering column.
Dash. Hollow pressed steel.
Ignition. Jump spark, storage battery and dry cells.
Carburetor. Special float feed.
Oiler. Gear driven individual feeds.
Front Axle. I beam, Timken roller bearings.
Rear Axle. Bevel gear, Timken roller bearings.
Wheels. 32 x 4.
Tires. Any standard make including Continentals.
Transmission. Nickle steel hardened, 3 speeds forward and reverse.
Brakes. 3 extra large.
Body. Handsome, seating five.
Weight. About 2200.

THREE POINT SUSPENSION MOTOR, FLY-WHEEL AND TRANSMISSION INTEGRAL

AGENTS WRITE US REGARDING SELLING AGENCIES

DORRIS MOTOR CAR CO., 1211-17 N. Vandeventer Ave., St. Louis, U.S.A.

National

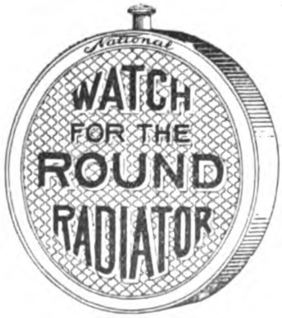
Reliability

Was demonstrated in the most convincing manner at Indianapolis on November 16 and 17, 1905, when a **NATIONAL STOCK CAR** made

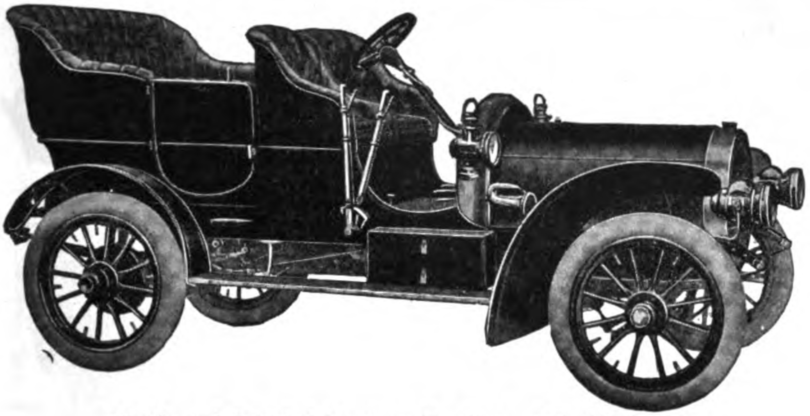
$1094\frac{3}{16}$ Miles in 24 hours

Breaking the world's record by $78\frac{9}{16}$ Miles

At the New
York Show
69th Regi-
ment Armory
Jan. 13-20



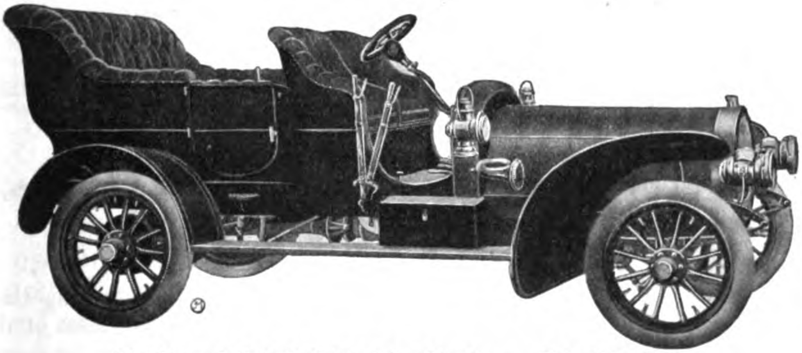
At the Chi-
cago Show
Coliseum
Space 76,
77, 78
Feb. 3-10



National Model D, 4 cylinder. 35-40 H. P.

Price, $3000

The Car that Broke the World's Records



National Model E, 6 cylinder. 50-60 H.P.

Price, $4000

An Innovation in Touring Cars

Stylish, powerful, smooth running, easily controlled. Aluminum body, seats 7 passengers comfortably, **all facing forward.**

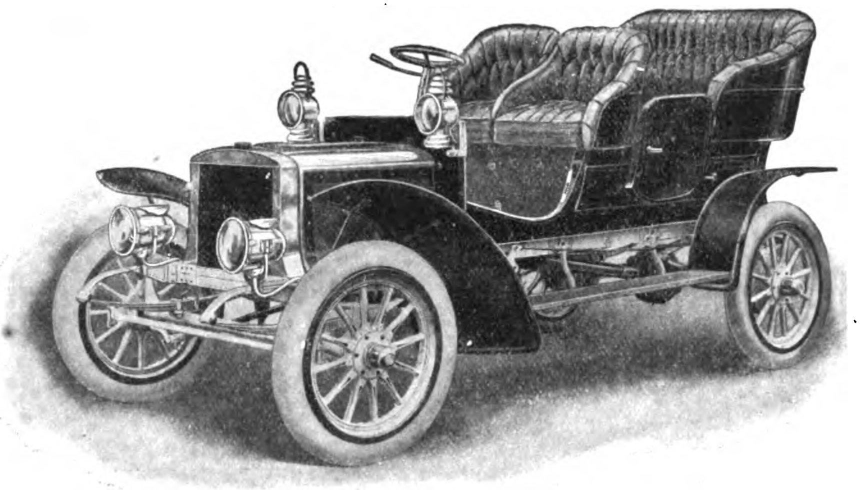
WRITE FOR PARTICULARS

NATIONAL MOTOR VEHICLE CO.

1003 East 22d St., Indianapolis, Ind.

DISTRIBUTORS—Linscott Motor Co., 163 Columbus Ave., Boston. Homan & Schulz Co., 38th & Broadway, New York. Ralph Temple Auto Co., 311 Michigan Ave., Chicago. Tioga Auto Co., Broad & Tioga Sts., Philadelphia. Fisher Auto Co., 330 N. Illinois St., Indianapolis. Liberty Auto Co., 138 Beatty St., E., Pittsburg. Colonial Auto Co., 3944 Olive St., St. Louis.

Northern



Silent Northern Touring Car, 20 h. p., 5 Passengers, Double Side Entrance, 4 Inch Tires, Gas and Oil Lamp Equipment, $1800.00

The same practical advantages which distinguish the Northern Touring Car for 1905 will characterize our 1906 products, viz: Quietness in operation, ease of riding and remarkable freedom from vibration and dust.

The Silent Northern still stands alone as the car ot simplest and most compact mechanism. Its encased mechanism, three-point motor support, and 24-inch fly-wheel with fan blades cast integral have demonstrated again and again their efficiency and vital importance.

Power applied direct to rear axle, only one universal joint. No belts, no chains, no gaskets. No truss rods, no strut rods, and no side levers. No vibration.

- - 1906 MODELS - -

Model K, 30 h. p., 4 Cylinder Touring Car with gas and oil lamp equipment,	$3000
20 h. p., Limousine, - - - - - - -	2500
20 h. p., Two-cylinder Touring Car with gas and oil lamp equipment,	1800
7 h. p., Sturdy Northern Runabout with lamp equipment, -	650

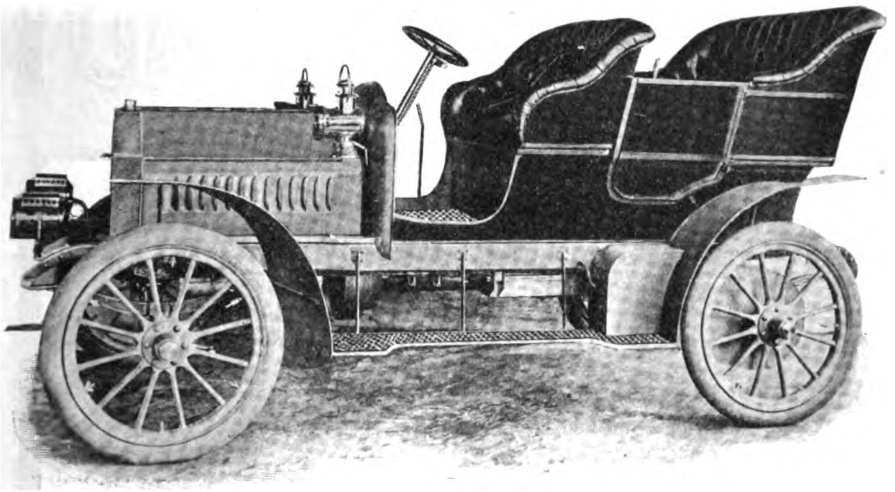
Dealers are invited to write at once for circular 53
containing important advance information.

Northern Manufacturing Co., • Detroit, U. S. A.

Member Association of Licensed Automobile Manufacturers.

We will exhibit at Madison Square Garden January 13 to 20, 1906, and at Chicago in February.

THE 1906 CRAWFORD



4 Cylinder. 24-28 H. P.

Cylinders, 4½x4½ inch (individual).

Weight, 2100 lbs. **Price. $2000.00**

Unequalled for price, and for satisfactory service not excelled at any price.

....Specialties....

All working parts integral with chassis, so that same can be operated with body removed. Chains covered by leather boots. Rear hub has long sleeve that carries the sprocket and drum, and is supported by a four-inch roller bearing, which brings the chains in close to the frame, entirely out of the way of the running board and step to side entrance, without the disadvantages of overhang. Strut rods are attached to separate ball bearings on cross shaft so that no movement of the springs can cause the chain to either tighten or loosen.

The Lubrication is by force feed. Four powerful brakes. Transmission, sliding gear. Three speeds forward and reverse, operated by single lever. Special construction of great merit. Wheel base. 100 inches. Absolutely the best proposition of the year. Write for further details.

Crawford Automobile Co.

Hagerstown, - - Md.

We will exhibit at the Show of the A. C. A., to be held in New York January 13-20, at the Sixty-ninth Regiment Armory

Agents for New York and vicinity, NEW AMSTERDAM MOTOR CO., 152 W. 56th Street

EVER READY

THE FAMOUS EVER READY ELECTRIC LIGHTS

EVER READY

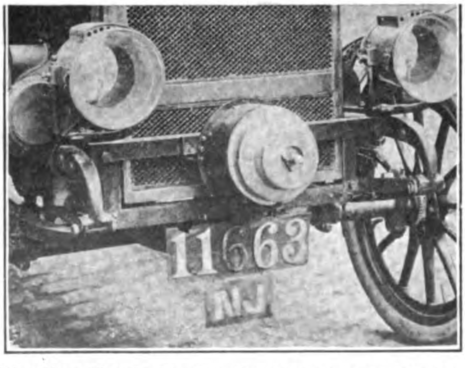
EVER READY

Start Your Motor From the Seat

Broken bones, bad temper and other cranking troubles removed by using the

Ever Ready Automatic Starter

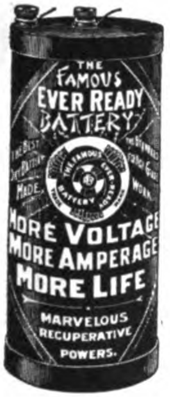
It will be one of the great sensational features shown at the Ever Ready Exhibit, Concert Hall Stage, Madison Square Garden Automobile Show. **Don't Fail to Investigate.** It is absolutely the most essential and important attachment for an automobile that has so far been produced. It is a success and we can prove it. Get your order in at once, for the demand is sure to exceed the supply.



The Ever Ready Engine Starter in place on the front of a car.

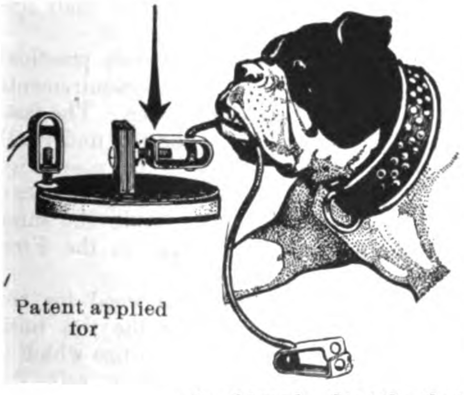
American Electric Nov. & Mf'g Co.
• 304 Hudson Street — New York City •

EVER READY


THE FAMOUS EVER READY BATTERY
THE BEST DRY BATTERY MADE.
MORE VOLTAGE
MORE AMPERAGE
MORE LIFE
MARVELOUS RECUPERATIVE POWERS.

The "Ever Ready" Battery

Solves the battery problem. The battery for high grade work. High Amperage—Long Life. Highest award at Lewis & Clark Exposition. Test them against others and we get the order.



Patent applied for

Bull Dog Battery Connections

No more loose battery connections. Instantly applied or removed without tools. Can't rattle loose. Perfect contact always. It's one of those little things which save a big lot of trouble and time.

"So Simple, Yet So Satisfactory"

Many other "Ever Ready" Improvements
SEND FOR PRINTED MATTER

American Electric Nov. & Mfg Co.
· 304 Hudson Street — New York City ·

"Firestone"

A New
PNEUMATIC TIRE

MADE BY

FIRESTONE **The Rubber Tire Specialists**

After exhaustive experiment and careful study of the requirements of pneumatic tires, we have invented a tire which has every possible good feature of the best, with practically all of their objectionable features eliminated.

Firestone pneumatic tires have withstood the most exacting tests during the past two years and we can assert positively that we have more nearly reached the point of absolute perfection than has yet been attained by pneumatic tire makers.

Firestone tires are sightly on the wheels. Good, practical common sense and accurate knowledge of the rigorous requirements of a good tire are apparent to the most casual observer. The fastening device is positive and will securely hold the tire under all conditions and, whether inflated or deflated, there is no possibility of creeping or rim cutting. The most inexperienced person can easily remove the tire in two minutes and replace it in the same time, and he **cannot pinch the inner tube** because in the Firestone construction it simply **cannot be pinched**.

For many years the name **FIRESTONE** has stood for the highest grade of excellence in solid tires. We know the tire business in every detail. We know we have a pneumatic tire which is without a peer, a tire which will receive and merit an extensive demand. To enable us to meet any demand which may be made, we have erected immense new buildings and equipped them solely for the manufacture of pneumatic tires.

OUR FACILITIES ARE ENORMOUS. OUR TIRES ARE RIGHT. Our successful business career has demonstrated our ability to accomplish what we undertake.

We want you to know more about Firestone tires. Study them. Examine them as closely as you please and we know you will be a Firestone customer. Write for illustrated booklet.

FIRESTONE TIRE & RUBBER CO.
Akron, Ohio
New York Chicago Philadelphia Boston St. Louis Detroit

"Firestone"

FIRESTONE

Side-Wire

Solid Motor Tires

are a demonstrated and assured success

More than eighty-five per cent. of all commercial vehicles in operation are equipped with Firestone Tires and they are extensively used on Motor Busses, Cabs, Electric Victorias, etc.

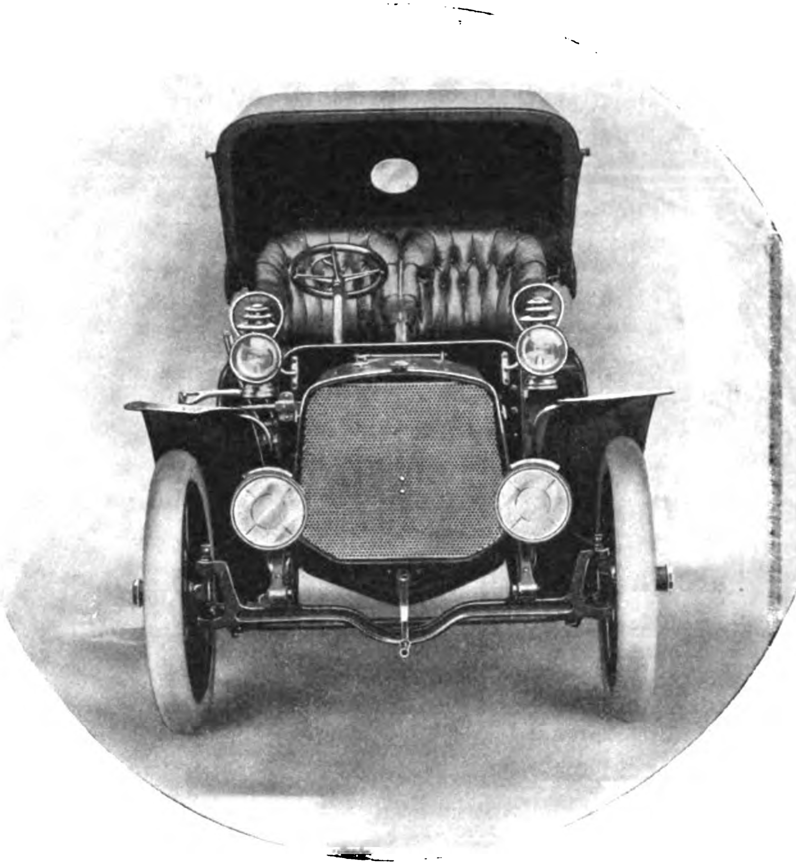
We do not claim them to be the **BEST KNOWN** tires for these classes of vehicles without good reason, and we are able to sustain and prove every claim we make.

FIRESTONE SIDE WIRE TIRES are made from a superb, wear-resisting quality of rubber. They are made by expert workmen in accordance with the ideas of the oldest and most successful tire maker in the business—Firestone ideas.

Our **SIDE WIRE TIRES** have made possible the success of the commercial motor vehicle of to-day, and actual tests prove them the most economical tire made.

THEN WHY NOT
FIRESTONE?

FIRESTONE TIRE & RUBBER CO.
Akron, Ohio
New York Chicago Philadelphia Boston St. Louis Detroit



TURNING THEM OUT

—not by the mile, nor by the hundred—but one at a time—three times a week. That is how uniformly high-grade construction is assured in The Lozier Motor Cars. And each car is perfect or it would not be turned out—it would be turned down. We spent nineteen months in the most thoroughly exhaustive experimenting before we completed our first car, which appeared in August, 1904, and added to our sum of knowledge for ten months more before our first delivery was made—in June, 1905; and we felt then, as others are realizing now, that our tireless efforts to produce the very best before it was given to the public had landed us at the first jump right at the top, with a car that is so vastly superior to any other American make, and so certainly the equal of the best of the foreign product, that, with a few other American manufacturers following the Lozier lead, the day of the foreign motor car in the American market will soon be over. Too great haste in building, and an overmastering desire for quick returns and large profits, have not given American workmanship a chance to assert its superiority. We were in no haste to announce The Lozier Motor Cars, nor are we in a hurry about turning them out—we are not slow by any means, we are merely sure—for The Lozier kind of high-grade construction demands time and care. We have said that Lozier Motor Cars are equal to the best of the foreign product—we might go further and assert that they are better—for if they are equal to them in every other point and superior to them in at least one, it follows that The Lozier Motor Cars are the best in the world—and in the hardened and ground crank-shaft (turned, hardened and ground on its own centers), we claim a superior point in correct construction that is not to be found in any other car—foreign or domestic. We have other points besides. In price, our Limousines, Landaulets and Touring Cars are comparatively high—and they ought to be; for they cost money to build—as we build them—and good construction is everything. Call and see them at our New Building, 55th Street and Broadway, New York City, and at the Automobile Show, Sixty-ninth Regiment Armory, January 13th to 20th, 1906.

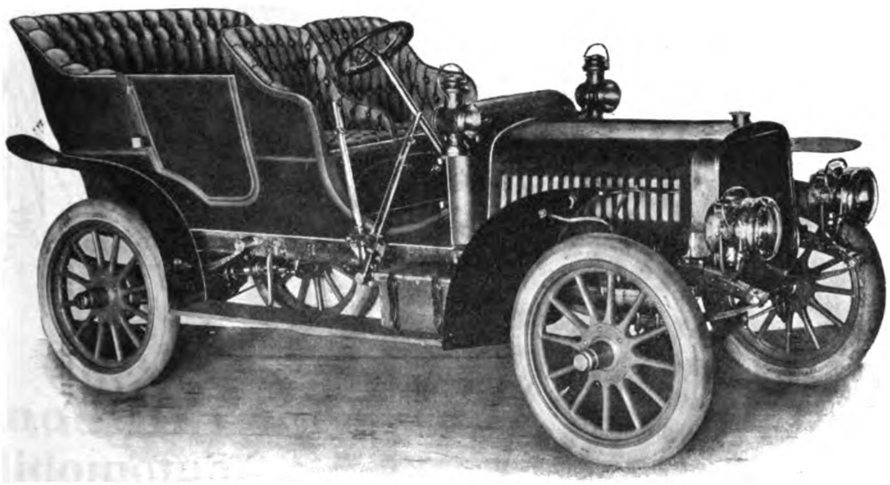
LOZIER

THE LOZIER MOTOR CO.

1906

MOON

(The honest car)



1906 Moon. Model A

$3000

F. O. B.
St. Louis, Mo.

The Moon is a superior car and will be appreciated by experienced buyers :: ::

ENGINE—4-Cylinder Special. 30-35 H. P.
BODY—Most approved type. Seating capacity 5.
FRAME—Cold pressed steel, drop forged spring hangers.
TRANSMISSION—Sliding gear type, 3 speeds forward and 1 reverse; direct on high speed.
DRIVE—Bevel gear. Weight, 2400 pounds. Wheel base, 106".
BRAKES—3; 2 on rear hubs, 1 on transmission.
COOLING—By water. Improved honeycomb radiator with fan.
IGNITION—Jump spark, batteries and coil.
CLUTCH—Improved multiple disk.
TIRES—Front and rear 34"x4". Speed 3 to 50 miles an hour.

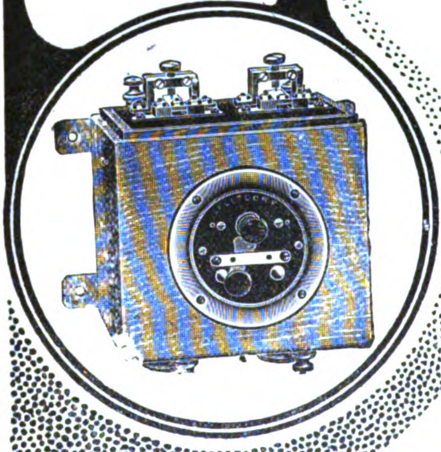
FOR FURTHER PARTICULARS WRITE TO

MOON MOTOR CAR CO., St. Louis, Mo.

SEE US AT THE AUTOMOBILE SHOW

69th Regiment Armory, New York, Jan. 15th, 1905. Look for us on the main floor.

SPLIT

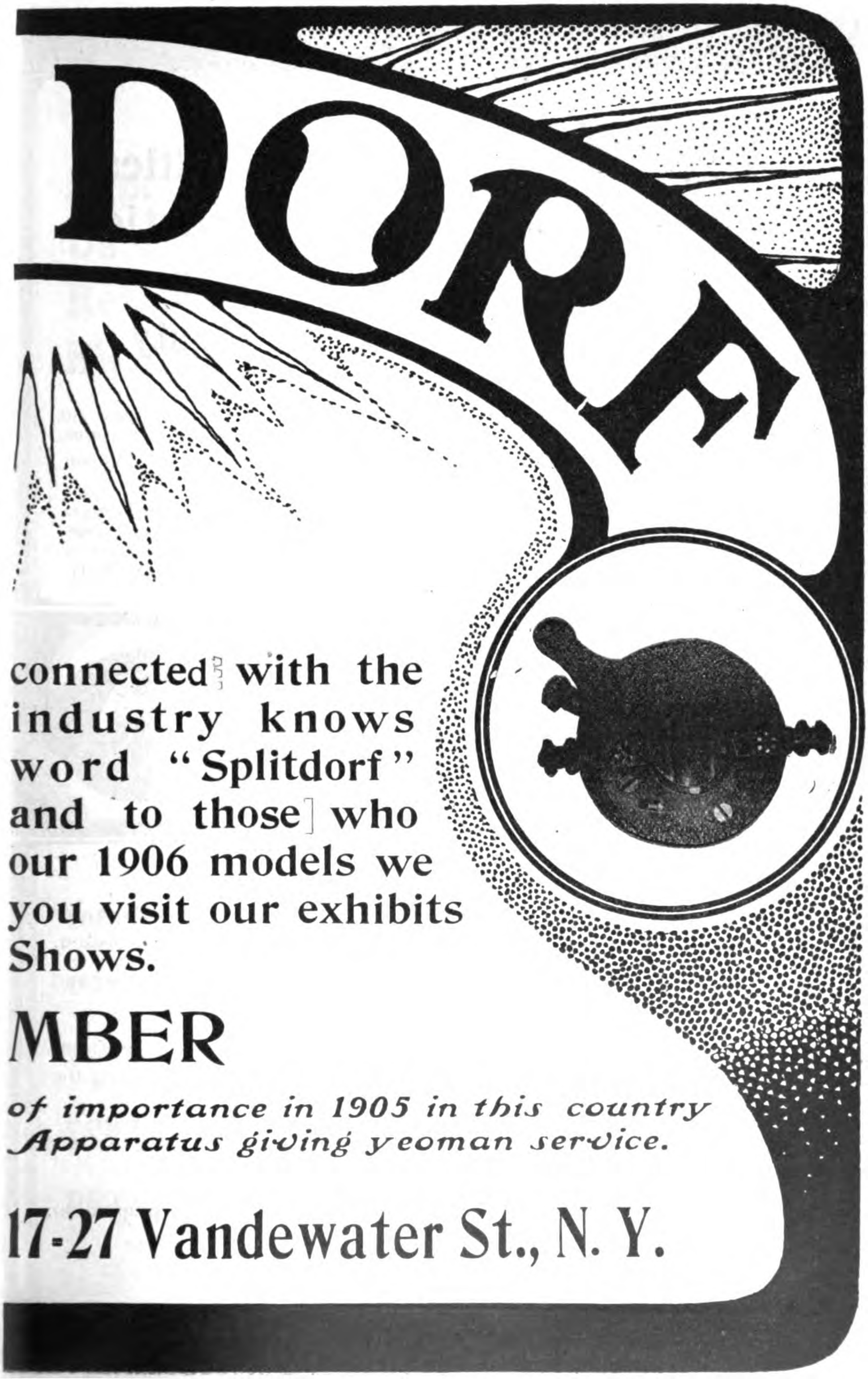


EVERY one
automobile
what the
represents
have not yet seen
urgently request that
at both New York

REME

All Marine and Automobile contests
were won with the Splitdorf Ignition

C. F. SPLITDORF



DORF

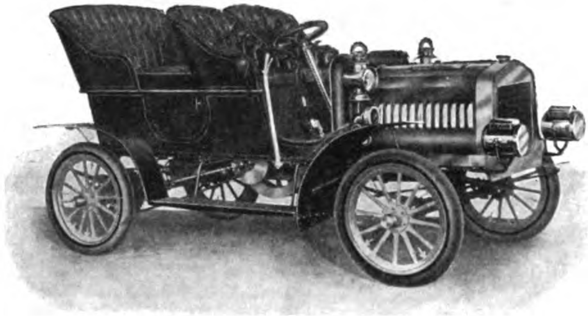
connected with the
industry knows
word "Splitdorf"
and to those who
our 1906 models we
you visit our exhibits
Shows.

MBER

of importance in 1905 in this country
Apparatus giving yeoman service.

17-27 Vandewater St., N. Y.

THE GALE 1906



Faultless
Artistic
Sure
Trusty

MODEL E: DETACHABLE TONNEAU. Any standard tires. Gas head lights, oil side lights, oil tail light, dash horn, tool kit, ironed for top. Price, $1250.00.

MODEL F: Same as Model E, but with cape cart top, curtain and apron. Price, $1325.00.

SPECIFICATIONS: 8 H. P. Single Horizontal 5x6 motor, with large single lubricator. Spur gear planetary transmission, single heavy chain drive, to large live rear axle. Ratchet retained external band brake. Good road clearance; 5 gallon fuel tanks; 73″ wheel base; 54½″ tread; weight, 1100 lbs., **and tilting body.**

GALE

DON'T think this a new and untried proposition. It's not. It's just a larger Gale runabout, and Gale runabouts proved their worth last season.

DON'T overlook the fact that in buying this, you get a complete car and you don't have to go down in your jeans for extra lamps, etc.

DON'T forget that the Gale Touring Car has the tilting body, like the runabout, and that you can inspect or adjust any part, **without** doing the crawl act.

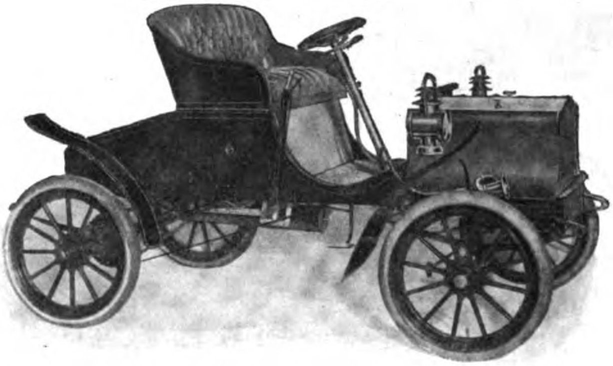
DON'T fail to get our printed matter and see what a good thing we are offering you.

DON'T hesitate if you are a dealer, to ask us by first mail for our proposition. It's good and you had better close before the Shows.

THE WESTERN TOOL WORKS
GALESBURG, ILL. U. S. A.

THE GALE 1906

Superior
Useful
Reliable
Elegant



SPECIFICATIONS: 18 H. P. Double opposed 5x5 motor, with Hill Precision oiler. Heavy spur gear planetary transmission; single heavy chain drive, to large live rear axle. Ratchet retained double external hub band brakes. Good road clearance, metal dash and running boards. 15 gallon fuel tanks. 92" wheel base, 56" tread; weight, 1700 lbs. Full tool kit **and tilting body.**

GALE

DON'T you know this is the simplest and best runabout on the market? If you are from Missouri, our agents can show you.

DON'T you think a wide seated, comfortable riding, powerful runabout, with three bow cape top and curtains, for $650, is a snap?

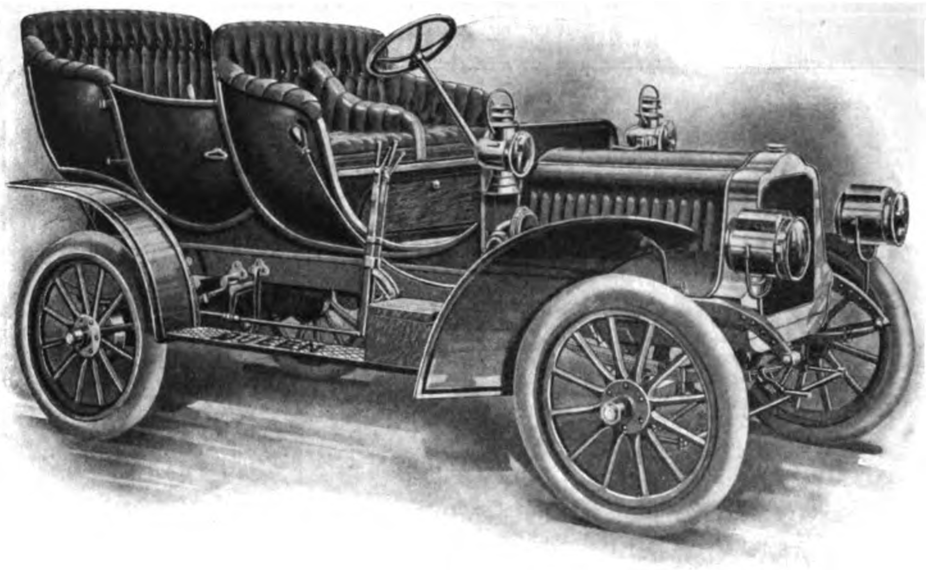
DON'T you understand that a good single cylinder car, that is convenient and easy to get at, is better than a cheap multiple cylinder?

DON'T you realize the truth of the statement that it's easier to care for **one** engine than it is for **two** or **four?**

DON'T you believe that it's worth two cents to ask us more about the Gale cars?

THE WESTERN
TOOL WORKS

GALESBURG, ILL.
U. S. A.



Touring Car Model "K," $2000.00

THE QUEEN

The Big 1906 Queen is a Queen for Fair

Motor Power, 23 to 28
No. Cylinder, 4 Vertical
Wheels, 32 x 4
Transmission, Sliding Gear
Speeds, 3 Forward and Reverse
Front Axle, Solid Drop Forging

Frame, Pressed Steel
Wheel Base, 101 inches
Batteries, Storage
Equipment includes five lamps
Horn and complete set of tools

We also have a handsome two-cylinder 18 H. P. Touring Car with detachable side door tonneau listing at $1100.00, and a two-cylinder 14 H. P. Runabout listing at $800.00.

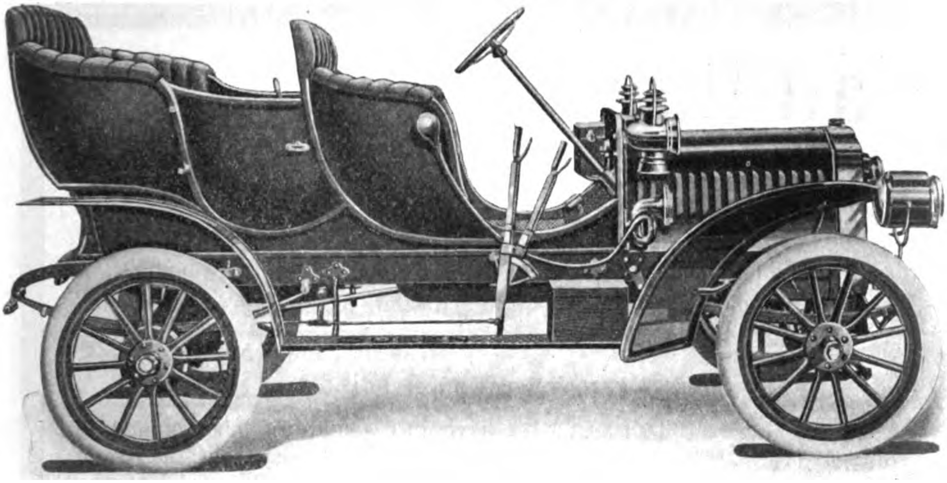
New York Agency: The Majestic Automobile Co.
Cor. 54th and Broadway

Chicago Agency: The Branstetter Motor Co.
1337 Michigan Avenue

We will exhibit at the New York, Chicago, Boston & Detroit Shows
Write us for Agency Proposition and Catalog giving full particulars.

The C. H. Blomstrom Motor Co.

Detroit, Mich.



THE QUEEN

Model "K"

4 Cylinders 4¼ x 4¾, 26 to 28 H. P. Cylinders, Pistons and Piston Rings made from best foreign iron, costing from three to four times as much as American iron. All bearings extra long and bushed with Parsons White Brass, the best bearing metal known. Cylinders, Pistons, Piston Rings, Crank Shaft, Valves, Universal Couplings and Transmission Shafts accurately ground. High Carbon Steel used in all gears and forgings. All Gears carbonized after being cut, and Crank Cases made from high grade Aluminum. Geared Circulating Pump and positive oiling system. The Motor throughout is a model of strength and simplicity.

New York Agency: The Majestic Automobile Co.
Cor. 54th and Broadway

Chicago Agency: The Branstetter Motor Co.
1337 Michigan Avenue

We will exhibit at the New York, Chicago, Boston and Detroit Shows

Write us for Agency Proposition and Catalog, giving full particulars

The C. H. Blomstrom Motor Co.

Detroit, Mich.

Cadillac Salability

The following letter was recently received from The Wm. Galloway Co., one of the principal Cadillac dealers in the state of Iowa.

Waterloo, Iowa, Nov. 6, 1905.

CADILLAC MOTOR CAR CO., Detroit, Mich.:

Gentlemen:—We have just wound up our automobile season, and in this connection wish to say that the trade has gone way beyond our expectations. The facts of the case are, we got all the trade there was in the town and around here.

Now, as I tell my customers, it is not because they are buying machines from us that we are doing such a big business. It is simply the machine. The Cadillac automobile is **right**. You have struck the happy medium. The trouble with the average man who buys an automobile is that he is misled, and thinks unless he buys a car with two cylinders and rated at from 16 to 40 horse power, he will not get a satisfactory machine. This is exactly where he is mistaken. I was mistaken myself in this same way, because when I first got the automobile fever no man could make me believe anything was right but a double cylinder, but my mind has been changed, and changed radically, since I have handled the Cadillac.

What more does a man want than an automobile that will take him any place he wants to go, faster than he cares to ride, and will positively handle any mud, sand, and roads in a manner that machines of three times the horsepower cannot touch? This is exactly our experience with the Cadillac automobile. We sold twenty carloads of them this year with not one single dissatisfied customer, and fully expect to sell 120 machines this coming season, but will only place our order for 50 as a starter.

I will tell you what sells Cadillac automobiles. First, it is the men who own Cadillacs telling their friends, and, second, the machine itself. I consider it the most valuable automobile agency in America, without a single exception.

Very truly yours,

THE WILLIAM GALLOWAY CO.

Dictated by Wm. Galloway.

Cadillac Motor Car Co.

Detroit, - Mich.

Members of Association Licensed Automobile Manufacturers.

The Rapid Motor Commercial Vehicles

Our entire organization has from the very first been devoted exclusively to the building of Commercial Vehicles.

The success of Rapid Motor Wagons is due to the fact that they are built to give heavy, continuous service, and carry heavy loads.

The wagon illustrated weighs 2230 lbs. and carries 3000 lbs. easily. Rear wheel measures 34 inches; front wheel, 32 inches; solid tires. The double side chain drive insures a maximum of power delivered to the 2-inch solid steel axles. The cut illustrates only one of our many bodies. Size and style of body furnished to meet your requirements.

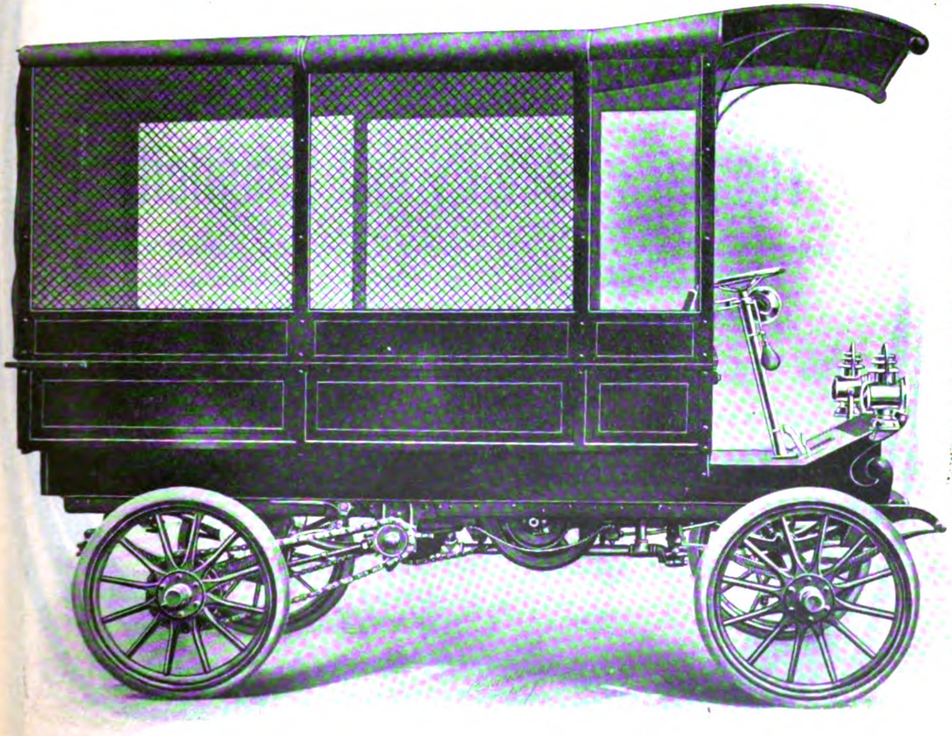
Price, one ton, $1400; one and one half tons, $1800

FULLY GUARANTEED FOR ONE YEAR

Agents can secure territory by writing me now, before all choice allotments are gone. Our new factory is a guarantee of prompt delivery.

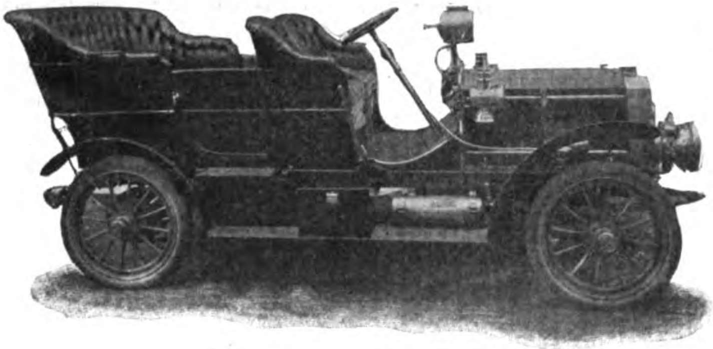
Address, B. M. HENRY, Sales Manager

RAPID MOTOR VEHICLE CO, Pontiac, Mich.



GROUT

GASOLINE CAR



Price, $2500

Including Top, Headlights, Two Oil Lamps, Horn and Full Set Tools.

The Car of Quality and Simplicity

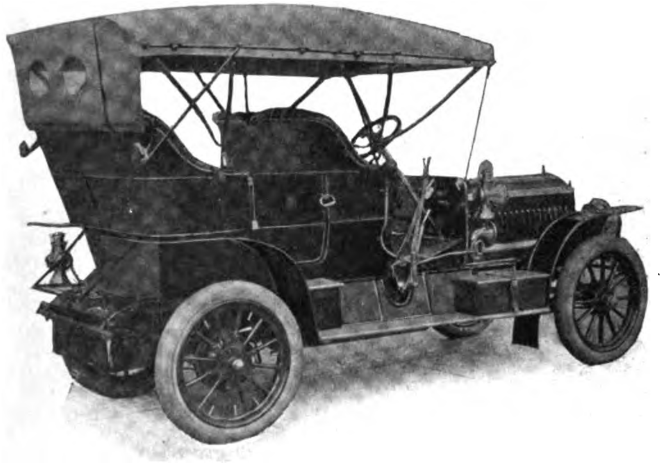
Four cylinder, 30-35 H. P., water cooled, high tension ignition with one coil and distributor. All wires stationary. Quadrants with spark retainer and throttle stationary, not turning with wheel. Perfect system of oiling, both splash and new mechanical oiler. Write for our catalogue.

Grout Bros. Auto Co.
ORANGE, MASS.

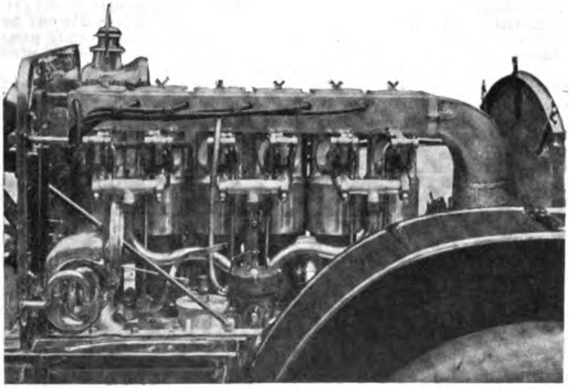
N. Y. AGENCY—Menseng & Chapman
1855 BROADWAY

FRAYER-MILLER

The Sensational Car of 1905



Properly Cooled By Air



First American Six-Cylinder Car

An **Unqualified** Success. Will be seen at the Armory Show, New York.

TWO MODELS

Four Cylinder, 24 H. P., 2,000 lbs., $3,000. Six Cylinder, 40 H. P., 2,500 lbs., ·
Cylinders, both cars, $4\frac{1}{16}$ x $5\frac{1}{4}$ inches.

RECORDS

3202 Miles in 6 days, 15 hours, 29 minutes. 1866 miles without a stop.

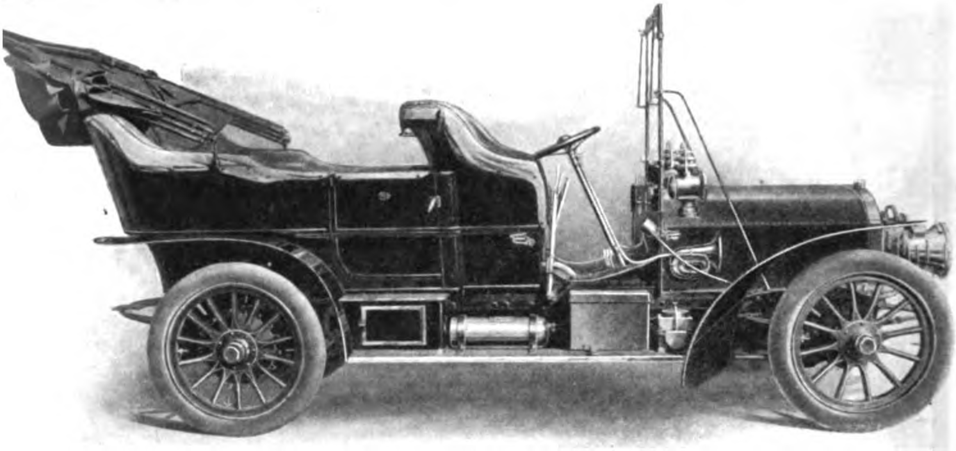
UNBEATEN.

Oscar Lear Automobile Company, Columbus, O.

Frayer-Miller Automobile Co., 941 8th Ave., New York

We will Exhibit in Madison Square Garden Automobile Show, January 13-20.
Space No. 39.

The "Matheson" touring car is designed to compete principally with the very finest and highest priced cars of foreign make. Its exceptional qualities and superior operation can only be fully appreciated by *actual comparison* with others, *part for part*, and by *actual long-distance road demonstration.* It is, without any exception, far and away the most thoroughly mechanical, the strongest built, the most powerful, the fastest, the handsomest and the most completely equipped car on the market to-day.



CHARACTERISTIC FEATURES:

Self-starting from the seat.
Make-and-Break ignition with magneto.
Four-cylinder vertical engine.
All valves in the head mechanically operated.
Valves never require regrinding.
All valve-actuating mechanism, on top of engine quickly accessible.
Absence of Vibration.
Noiseless in operation.
Automatic, wide-range, multiple-spray carburetor; will stay adjusted and vaporize any grade of gasoline.
Automatic speed control by governor.
Automatic lubrication, multiple, positive force feed.
Clutch, multiple-disc, metal to metal. Will run thousands of miles without adjusting.
Sliding-gear transmission, chrome nickel steel.
Hess-Bright (imported) ball bearings on transmission shafts, differential shafts, steering knuckles, and in clutch actuating mechanism.
Roller bearings on all wheels.
Extra large bearings throughout, insuring long life.
Double Chain drive.

Four especially powerful brakes.
Hill-pawl prevents car backing down grade.
Irreversible steering gear.
Axles, special nickel-steel forgings; I-beam pattern.
Nickel-steel frame, cold rolled pressed.
Flexible reciprocating rotary spring suspension, eliminating all torsional strains on front and rear springs.
Radiator, honeycomb type.
Gasoline tank, capacity 20 gallons.
Long half-elliptic springs, front and rear.
Aluminum pan underneath car.
Tires, 36x4 inches front; 36 x4½ inches rear.
Wheel base, 40-45 H. P., 112 inches. 60-65 H. P., 118 inches.
Side-entrance aluminum bodies, superbly finished; the unparalleled production of J. M. Quimby & Co. and Moore-Munger Co., luxuriously upholstered.
Weight, 40-45 H. P., 2,960 lbs. 60-65 H. P., 3,160 lbs.
Speed, guaranteed; 40-45 H. P.; 60 miles per hour. 60-65 H. P., 70 miles per hour. Geared for greater speed if desired.

"America's Finest Motor Car"
One Year Guarantee

"Matheson"

40-45 H. P. $6,000 60-65 H. P. $7,500
With Complete Equipment Below

Our Complete Equipment Consists of

Cape-Carte top,
Storm curtains,
Standing glass front,
Detachable folding seats, with lazy backs,
Foot cushions,
Mats front and rear,
Large leather wallet,
Toilet set of comb, brush, mirror, whisk-broom and soap case,
Tool and accessory lock drawers,
Folding baggage rack,
Tire irons for carrying extra tires at side of car,
Tire covers, waterproof,
Coat rail,
Truffault-Hartford shock absorbers,
Acetylene generator or gas tank,
Acetylene headlights, oil side lamps, tail lamp,
Large dragon horn,
Gabriel horn,
Gasoline gauge,
Grademeter,
Reserve tank lubricating oil,
Jones Odometer-Speedometer,
Complete set tools and tire repair outfit,
Water-gauge,
Dashboard 8-day clock,
Monogram on doors,
Extra parts.

Complete catalogue giving full details mailed upon request.

MATHESON MOTOR CAR CO. - - WILKES-BARRE, PA.

Member Association Licensed Automobile Manufacturers.
(Formerly Holyoke, Mass.

N. B.—Our new factory is one of the largest and most modern in the world.

Maxwell

THE SECRET

of our success we are willing to impart, because it is a policy of which we are proud. Every automobilist is interested in keeping down the cost of up-keep. We made a careful study of this subject, and as a result of our investigations and experiments we ascertained that the motor car to be economical, and at the same time render satisfactory service, must be not only well made, but simply constructed. Our cars we therefore designed right, and built right, and being right, they sold well and made friends.

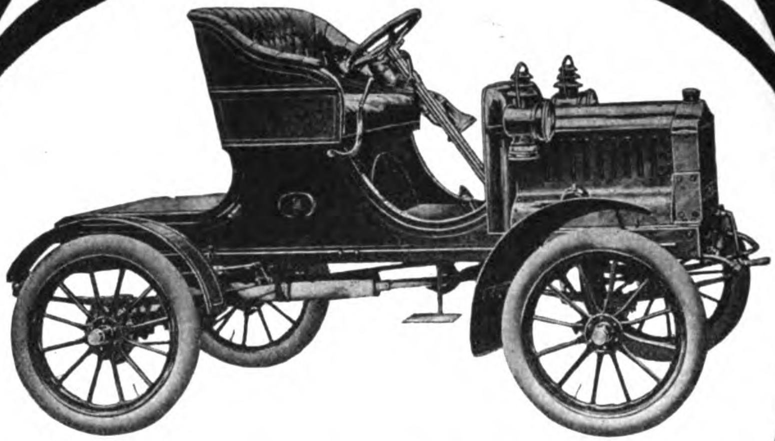
This is our secret. The information is such as will interest any intending buyer.

Members American Motor Car Manufacturers' Association

Foreign Representatives (except Canada and Mexico)
RICHARD IRVIN & CO. 25 Broad Street New York City

MAXWELL-BRISCOE MOTOR Co.
TARRYTOWN, N.Y.

Maxwell



The Tourabout. Price, $780.00

"Matchless" is probably the most appropriate term to apply to the **Maxwell Tourabout.** There is no automobile in the runabout class that can compare with it for power, economy of maintenance, appearance and price. We know that it is in a class by itself, and being without a competitor, it is a car which any automobilist will be glad to buy, or any agent will be willing to back with his reputation. Our knowledge of the advantages of this car induced us to contract for materials to build 2500 for 1906. This is good proof of its value, isn't it?

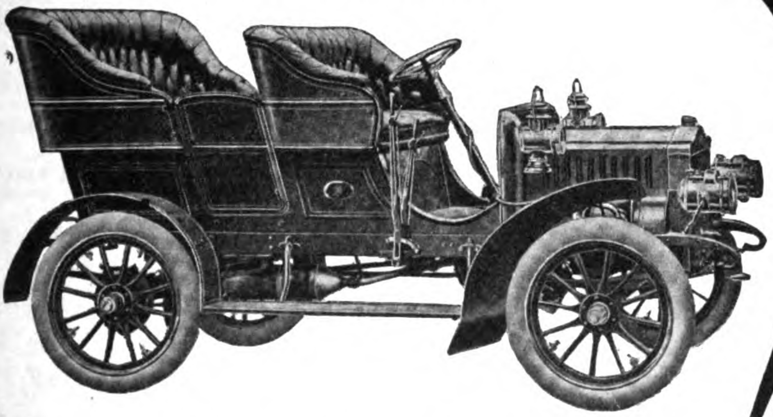
Members American Motor Car Manufacturers' Association

MAXWELL-BRISCOE MOTOR Co.
TARRYTOWN. N.Y.

Maxwell

Model "H," Touring Car

PRICE, $1450.00



The "just right" touring car is the synonym appropriate to the **Model "H," Maxwell.** The price is moderate, the construction is simple, but good, and the working parts are easily accessible. It has the maximum amount of speed and power for the minimum of gasoline and oil consumption. It will run with less adjustment and repairs than other touring cars, and the cost of operation is low. Hard usage for a season does not materially lessen its value. It is a practical automobile.

Members American Motor Car Manufacturers' Association

MAXWELL-BRISCOE MOTOR Co.
TARRYTOWN. N.Y.

Maxwell

Look for us At the New York Automobile Show

to be held in the Armory of the Sixty-ninth Regiment, January 13th to 20th. We will exhibit our full line of motor cars,—the "perfectly simple and simply perfect" automobiles.

Maxwell Cars were popular from the time they were first produced. They are bought by a discriminating class of buyers, and are sold by the most experienced dealers,—those who are judges of automobile values. You cannot estimate the true worth of an automobile by its price,—a year's use is the only true standard for judging a motor car's value. Write us for a booklet containing the testimonials of users of **Maxwell Cars,** and call to see us at the New York Automobile Show.

Members American Motor Car Manufacturers' Association

MAXWELL-BRISCOE MOTOR Co.
TARRYTOWN. N.Y.

CYCLE AND AUTOMOBILE TRADE JOURNAL

Vol. X. No. 7 PHILADELPHIA AND NEW YORK JANUARY 1, 1906

December Edition 25,066.

18,905	Copies mailed.
5,150	Copies delivered to News Company.
583	Copies to Phila. and foreign under stamps.
490	Copies held in reserve.
25,128	
62	Back numbers sent out.
25,066	Total copies December edition. Of these
11,058	were paid subscriptions.
5,150	were news stand sales.
16,208	Total paid.

We print on this page each month an exact statement of the number of copies printed and distributed of the preceding issue of "The Cycle and Automobile Trade Journal."

The bindery count of actual complete copies produced in the December issue was 25,066. Of these 31,312 pounds were mailed at pound rates, as shown by post office receipts. Each copy weighs 26½ ounces, representing 18,905 copies, and 62 copies of unsold back numbers returned by news companies are accounted for, in addition to the total for the month.

We will be pleased to verify the above figures at any time to anyone interested.

An Old Patent Covering All 2-Cycle Engines.

The Elmore Mfg. Co., of Clyde, Ohio, announce that they have secured the American rights to a patent taken out by Joseph Day, of Rumford, England, sixteen years ago on two-cycle engines, which they state covers the basic essentials upon which nearly all of the present successful two-cycle engines are built. Although this patent has only one year still to run, we understand that the Elmore Co. will expect all makers of two-cycle engines to obtain a license from them to manufacture under this patent. We are unable to give more particulars at the present time, as this news has just reached us as we are closing our forms.

Coming Events.

Jan. 13-20—A. C. A.'s Sixth Annual Automobile Show, 69th Regiment Armory, 25th St. and Lexington Ave., New York. Automobile Club of America, 753 Fifth Avenue, New York.
Jan. 13-20—Madison Square Garden Automobile Show. Association of Licensed Automobale Manufacturers, 7 E. 42d St., New York.
Jan. 13-25—Belgian Automobile Salon, Brussels, Belgium.
Jan. 17-21—Reliability Trial and Hill Climbing Contest. Bombay to Mahableshwar, India. Motor Union of Western India.
Jan. 22-27—Ormond-Daytona Florida Beach Races. Florida East Coast Automobile Association.
Jan. 26-Feb. 3—Crystal Palace Automobile Show, London, England.
Feb. 3-10—Chicago Automobile Show, Coliseum, N. A. A. M., 7 E. 42d St., New York. S. A. Miles, Manager.
Feb. 3-18—Third Annual Auto Show, Art Palace, Turin, Italy.
Feb. 4-11—Cuban Auto Events, Havana, Cuba, Havana Auto Club.
Feb. 5-10—Washington Automobile Show. Washington Auto Dealers' Association.
Feb. 7-18—Berlin Automobile Show, Germany. German Auto Club.
Feb. 9-17—Automobile Show, Liverpool, England.
Feb. 11-12—Second Annual International Road Races at Havana, Cuba.
Feb. 12-17—Detroit Automobile Show. Tri-State Motor Car and Sportsman's Association.
Feb. 17-24—Cleveland Automobile Show. Cleveland Automobile Dealers' Association. Geo. Collister, Manager.
Feb. 24-March 3—Philadelphia Automobile Show, National Export Exposition Bldg. Philadelphia Automobile Trade Association.
March 13-20—Buffalo Automobile Show, Convention Hall. Buffalo Auto Trade Association. D. H. Lewis, Manager.
March 16-23—Boston Automobile Show. Boston Auto Dealers' Association. Chester I. Campbell, Manager.
March 18-27—Vienna Automobile Show, Vienna, Austria.
March 24-31—Automobile Show, Agricultural Hall, London, England. Cordingly & Co., Promoters.
May 3—Tourist Trophy Trials. Isle of Mann, Great Britain. Automobile Club of Great Britain and Ireland.
May 13-24—Motor Cycle Tour of France, starting from Paris. Auto-Cycle Club of France.
July 23—Start of Glidden Tour from Buffalo, N. Y. American Auto Association.
Aug. 27-Sept. 2—Brescia, Sicily, Events. Automobile Club of Italy.
Sept. 2—Florio Cup Race, Brescia, Sicily. Automobile Club of Italy.

It is proposed to include automobiles in the display of goods at the pure food industrial show at Jacksonville, Florida, to be held January 4-18.

The American Motor Car Manufacturers' Association's executive committee completed a two days' session on November 25 in New York. The E. W. Bliss Co., Brooklyn, the Whitehead torpedo people, and the Moon Motor Car Co., St. Louis, a branch of the Moon Buggy Co., were elected to membership.

Have you seen the 1906 models?

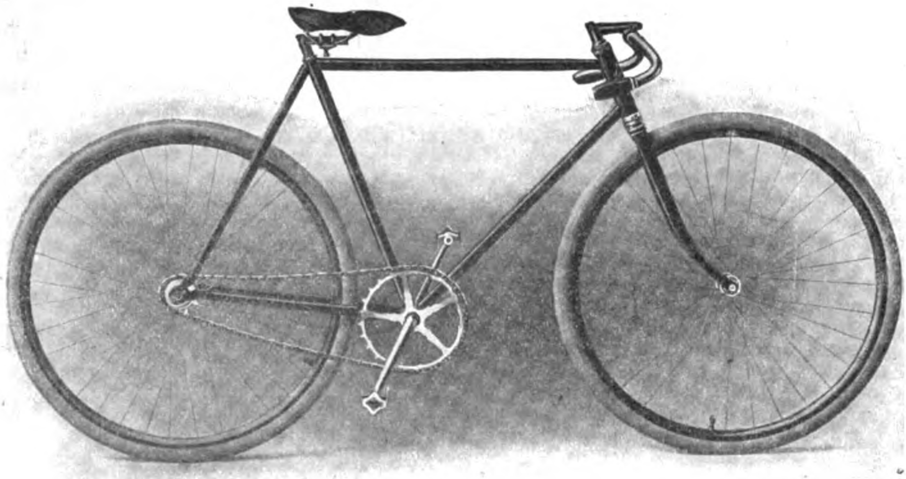
THE WHEELS OF HIGH DEGREE

ADLAKE AND CROWN

Our 1906 line is the best in style, finish and workmanship we have ever turned out.

Write for catalogue and prices to-day, you will take no chance if you order samples immediately.

Do you want to increase your bicycle sales? You can do so by selling the **CROWN.**



FULLY PROTECTED UNDER ALL PATENTS

GREAT WESTERN MANFG. COMPANY

La Porte, Indiana, U. S. A.

ADLAKE BICYCLES CROWN

FAUBER

REGISTERED

TRADE MARK

[PATENTED]

Fauber Patent One Piece Crank Hangers

will maintain for 1906, the same high standard as in the past,—that which has made them universally recognized as the best equipment for bicycles.

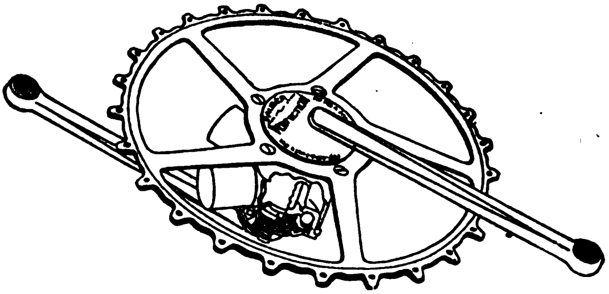
The fact that they are in one piece only will be appreciated as a distinct improvement over the old-style jointed cranks.

Write us for prices.

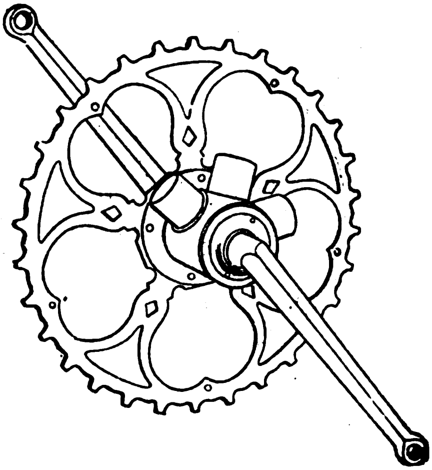
Do not buy a bicycle for the future unless protected by our patents.

Order all future bicycles with Fauber Cranks, your manufacturer can supply them.

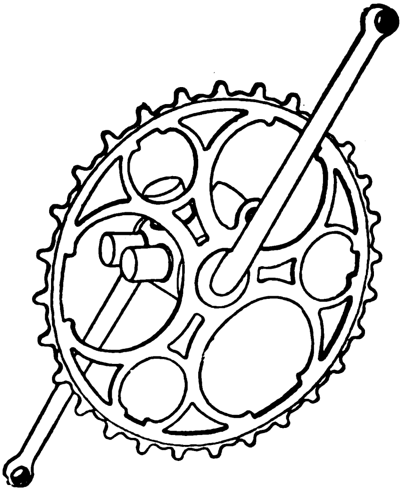
Great Western Mfg. Company
La Porte, Indiana



"PERFECTION"



"STANDARD"



"SPECIAL"

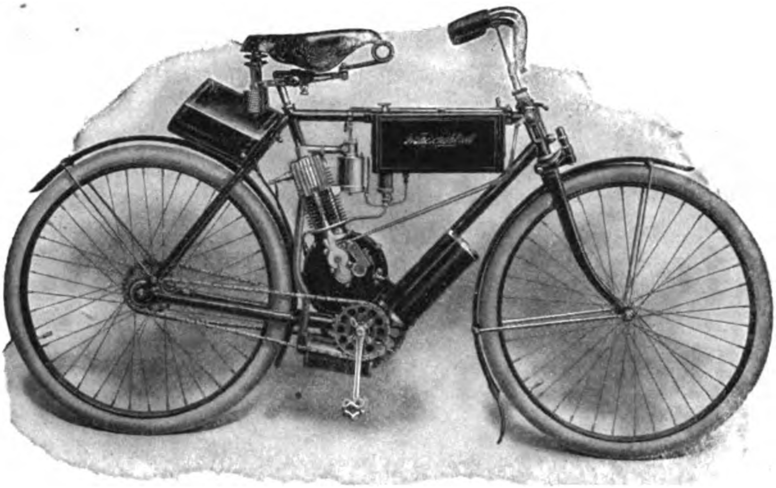
EXPORT REPRESENTATIVES:

Guiterman, Rosenfeld & Co.
35 South William St., N. Y. City

ALSO

LONDON PARIS HAMBURG

—THE 1906— THOROUGHBRED



A machine of the highest efficiency and perfection, worthy of its name—**THOROUGHBRED.** We have improved upon our 1905 model in every way possible, with the result that in perfection of detail, strength, power and beauty of appearance, the 1906 **THOROUGHBRED** is without an equal.

The position of the gasoline and oil tanks has been changed, as they are now placed in the diamond of the frame, offering them more protection, and steadying the machine by lowering the center of gravity. By means of a new oiling device operated from the seat, the rider may oil the motor without dismounting—an obvious advantage.

A Battery case, holding three cells is now attached at the rear, the long and expensive projectile battery having been dispensed with.

A new saddle of English make, second to none in quality and appearance will be used. It is also likely that a spring seat post will be added, as we are now making tests of this device.

The new Cushion Fork is probably the most important improvement. It has been thoroughly tested the past season and is a pronounced success. It has twice the spring and strength of other forks, and consists of fewer parts, having only three brazed joints. The top and bottom bars are heavily reinforced, and a one-piece head is used. The rear forks and stays are altered to accommodate a 2¼" rear tire, which is fitted to the 1906 machine.

The cylinder bore and stroke have been increased to 2⅝" and 3¼" respectively, thus increasing the power of the motor considerably. The **THOR MOTOR** which is used in the **THOROUGHBRED** has been improved in other features also, several changes in the carburetor resulting in a better mixture.

The effective grip control will be continued as heretofore.

While the **THOROUGHBRED** in the past has been eminently and wonderfully successful, the improvements in the new model are calculated not only to keep it in the lead, but to give such an amount of comfort and motor cycle perfection to the rider as to assure absolute satisfaction.

If you want to rider a "winner"– get the **THOROUGHBRED.**

If you want to handle a motorcycle that will prove a money-maker, write for the **THOROUGHBRED** agency.

See the advertisement of our 1906 bicycle line on page 252

READING STANDARD CYCLE MFG. CO., **READING, PA.**

Leavitt & Bill San Francisco, Cal.—Distributors for the State of California.
Scott Supply & Tool Co., Denver, Colorado.—Distributors for the Rocky Mountain States.

CYCLE AND
AUTOMOBILE
TRADE JOURNAL

ENTERED AT THE PHILADELPHIA POST OFFICE
PUBLISHED MONTHLY
TRADE ADVERTISING AND PUBLISHING CO.
1213 Filbert St., Philadelphia, Pa.

JAMES ARTMAN President
GEO. H. BUZBY Vice-President
C. A. MUSSELMAN Sec. and Treas.

WESTERN REPRESENTATIVE J. WALTER SCOTT
EASTERN REPRESENTATIVE F. M. DAMPMAN

Yearly Subscription - - - - - $1.00
Foreign Subscription - - - - - 2.00
Single Copies - - - - - - 15 cts

Change of advertising copy must reach this office not later than the 15th of each month. New advertisements will be accepted as late as the 20th

JAMES ARTMAN - EDITOR

Philadelphia, January 1, 1906

Description of 1906 Cars.

Notwithstanding the fact that we are printing in this issue more detailed descriptions of 1906 cars than have ever been printed in any single issue of any automobile paper ever published in the world, we have been compelled to hold over a very large number of car descriptions, owing to the impracticability of increasing the size of the paper to accommodate them all. By noting the number of lettered pages, our readers will see that we have already added about fifty pages more than we originally intended to have in this number, but notwithstanding this additional number of pages, we have gathered between fifty and one hundred pages of data on new models which must be held over for our February number. This, together with the data which will be gathered at the shows and before the shows will make our February number the most important one of the year, as it will contain more descriptions of new cars and new things than this issue, which is up to date the largest automobile publication, both as to reading matter and advertising matter, ever published in the world.

Early Shows.

We have for the past three or four years persistently and consistently advocated earlier National Shows. We have contended that the proper time to hold the National Automobile Show is in the fall of the year, either the latter part of October or the first part of November. We have made a canvass of the manufacturers of complete motor cars, of parts and of accessories, and they were almost unanimous in expressing themselves as being favorable to a show early in the fall. We have also canvassed the automobile dealers and agents, who have been even more pronounced in their conviction that the show should be held in the fall. It seems strange that with all this weight of opinion in favor of the fall show, that they should continue to be held in January. This condition can only be accounted for by the presumption that the show promoters and the owners of the buildings in which the shows are held, insist upon the January date, arguing that the public will not attend a show in November or October.

The fallacy of this argument has been fully demonstrated by the recent English Show, which was held in November, just at the period which we have always claimed to be the right one for the American Show. The attendance at this English Show held in November was more than double that of any previous English Automobile Show ever held, and the English shows were heretofore held in January. Not only was the attendance at the November English show of record-breaking proportions, but the English automobile press unite in saying that there were more early orders booked for new cars than has been true of any previous automobile show.

The advantages which the English manufacturers have secured through this early show are difficult to estimate. Not only have they secured orders far in advance of the season, which they can fill at their leisure, but they have secured their agents and arranged all of their plans for the coming season so far in advance that they can now go through the season in much better shape than they have ever done heretofore. Furthermore, they have had their show and exhibited their new patterns before many of the European or American makers were able to get their cars ready for exhibition. The European manufacturers were especially at a disadvantage at this English Show, as they could not get very many of their new cars ready in time to exhibit, where heretofore they have monopolized a large percentage of the space, consequently, the English manufacturers gathered in many orders which would have gone to foreign makers had the show been held late enough to allow these foreign makers to put their cars on view.

Exactly similar conditions hold here. If the American show is held in November the foreign makers will not have the opportunity to bring their cars over here in time to show them, and the American makers will therefore have a great advantage and would secure orders which go to foreign makers now at January shows, mainly because special arrangements are possible to bring cars here after the close of the Paris Exhibition. Further, as we have previously stated, by fixing an early date for the American exhibit, our makers are enabled to send their cars abroad to the foreign shows in time to compete with the foreign makers for their trade, which they are not now able to do. In other words, it will just reverse the present order of things, and will give the American manufacturer a great advantage over the foreign maker, as foreign manufacturers seem to have reached the limit of their ability to improve the automobile, whereas American manufacturers have made great improvements during recent years, and these will then receive the credit due them.

Drivers of Horses Should Have the Same Treatment as Motor Car Drivers.

Instead of the conditions under which automobiles are used becoming lighter they are daily becoming more burdensome. From all parts of the country reports are received of new laws going into effect which increase the obnoxious regulations governing the use of motor cars on the highways. Probably the best way to counteract and diminish the continually increasing restrictions on automobiles would be for all automobilists to insist that drivers of horses should be governed by the same regulations and restrictions that are applied to automobiles. Let the driver of a horse be compelled to apply for a license to drive his horse on the public highway. Let him undergo an examination to prove that he is capable of driving the horse with safety. And let the horses be tested to demonstrate whether they are not dangerously restive. Compel horse-driven vehicles to carry lamps both front and rear. Compel every horse-driven vehicle to be registered and carry a number. If the above was urged, the drivers of horses would see the injustice of the regulations which they are trying to enforce on the drivers of automobiles. It is just as reasonable to compel drivers of horses to abide by these restrictions as it is to enforce them on automobilists. Horses in incompetent hands are even more dangerous than automobiles. Statistics prove this. The number of accidents caused by horses are admitted to be very much greater in the aggregate than those caused by automobiles, and they are also, we believe, greater in proportion to the number used.

Bicycle riders ten years ago were confronted with practically the same conditions which now confront the drivers of automobiles. Regulations of all kinds were put in force against them, and it was found that the very best method to obtain justice was to insist that all vehicles should be treated alike. It is a fact that unlighted horse-driven vehicles on the roads after dark are very dangerous, especially so to drivers of automobiles, and it is just as reasonable for the automobilist to demand protection as it is for the horse driver to demand it. In fact, the law should be made universal. It should cover the entire use of the highway by all classes of vehicles, and it should also be made uniform throughout the country. We have repeatedly drawn attention to the great annoyance caused by the enactment of different laws by different States and by different boroughs and counties within each State. The situation in Philadelphia at the present time is an instance of this kind. Several years ago Philadelphia Council enacted an ordinance compelling all users of automobiles to obtain a city license and carry a city number. The State also enacted a law, but made provisions that each city within the State could issue licenses also, but this year a new State law has been enacted, which goes into force on the first of January, and the State Attorney General has stated that the State will not permit an automobile to carry any other number except the Pennsylvania license number on the car. The Philadelphia Automobile Club, therefore, contended that the Philadelphia city authorities could not compel them to put the city number on their cars and applied for an injunction to prevent the city from compelling automobilists to take out a city license, and carry a city number. The court has denied this injunction, and now the Philadelphia motor car drivers are "between the devil and the deep sea." If they carry both city and State numbers the State will prosecute them. If they do not carry the city number the city will prosecute them.

The test case which the National Association of Automobile Manufacturers has instituted to prove that all of these numbering and licensing laws are unconstitutional is still pending, and it is to be hoped that it will be pushed to an immediate conclusion. What would the authorities do if all drivers of motor cars would refuse to take out licenses and car numbers? We think such an action on the part of automobilists would bring this matter to a focus. Of course, it would lead to a great many lawsuits, but each State or each municipality would be satisfied to have one test case for all, and we do not think that more than a dozen arrests would be made in any one locality.

It is principally the horsemen who are instrumental in having these obnoxious laws enacted. The bill introduced into the House of Representatives by Colonel Morrell, Congressman from Philadelphia, is a sample. We do not for a moment suppose that such a measure will receive the serious attention of our National legislators, but the motive for this law will be understood when it is stated that Colonel Morrell has always been an enthusiastic horseman and his pet hobby is a four-in-hand tally-ho, the most dangerous vehicle on our roads, and as the four spirited horses of a tally-ho are difficult to handle when a motor car approaches, of course Colonel Morrell thinks that they should be kept off of the road. The "tally-ho" is such a necessary and useful vehicle.

Urge the Passage of the Federal Good Roads Bill.

The Fifty-Ninth Congress being in session, we deem it opportune to say to those who favor national aid to highway construction and improvement that now is the time to get in effective work with Senators and Representatives. The Brownlow-Latimer bill is a well-understood proposition, which has been outlined in these columns heretofore.

As we have pointed out, for many years the Federal government has been making large appropriations for river and harbor improvement. The theory upon which this has been permissible is that the improvement of transportation facilities is a matter of vital public concern and that the people will get enough good therefrom to more than warrant the expenditures. The acceptance of the soundness of this contention must carry with it the endorsement of government aid in the construction and improvement of wagon roads. These highways afford transportation facilities which after all most directly affect and come closest home to the greatest number of people. The produce which forms so large a part of the freight carried by the railroads must first be hauled by wagons from the farms. This is a large item in the aggregate, very much larger than is generally appreciated because so widely distributed and because each individual haul, taken by itself, is a small affair. The general government is supposed to have an interest in the welfare of all the people and a willingness to improve and promote it whenever and wherever possible. If this view obtains, the general government cannot long withhold its aid to road improvement along the line of the Brownlow-Latimer bill now before Congress, for certainly wagon road conditions affect more people than any and all other internal improvement projects. The main argument in favor of river and harbor improvements is that they promote the general welfare, and that the improvements entail an expense too heavy to be borne by the people of the localities most directly interested, and hence would never be made if the government refused to foot the bills. The same arguments apply with equal force to the improvement of the public highways. It is equally certain that this great work will remain undone, as it has through a century of our history, if the whole burden of the expense is left to be carried by the farming classes of the States. The farmers are the producers of the wealth of the country, preserving the balance of trade in our favor year by year. Secretary Wilson has just given us some astounding figures as the result of agriculture for the year 1905. The people who create this vast national wealth are certainly entitled to the nation's consideration. The enormous cost of bad roads to the farmers is not only destructive of the profits that should be saved to them, but is disheartening to agricultural ambition and to increased effort.

Nothing that this great government can do would be so profitable at this time as to extend its aid to highway improvement, and nothing that the automobile public can do for themselves is more important than to demand of Congress the enactment into law of what is known as the Brownlow-Latimer good roads bill. This paper urges the measure as one most essential to the national well-being, and we hope our readers will instantly take the matter up by personal letters and petitions to our Senators and Representatives in Congress. Hon. W. P. Brownlow will be pleased to send a copy of the bill to anyone who writes for it.

This is the most far-reaching economic proposition that the nation has ever been called to consider. It is no exaggeration to say that it involves more directly the general national welfare than any proposed internal improvement in our history. It is of greater consequence and concern to every branch of trade and commerce and to social life in the United States than any legislation Congress will have before it at this or any other session.

Triple Show Number.

The February number of the CYCLE & AUTOMOBILE TRADE JOURNAL will contain a very full and complete illustrated account of everything which has been shown at the two shows in New York during the week of January 13th to 20th, and in addition, will give a forecast of the new things that will be shown at the Chicago Exhibition for the first time. This number will be very much larger than any previous show number which we have ever issued. It must necessarily be so this year as there are two shows in New York, each one of which is as large as the single show was last year. The Chicago show will occupy an Armory building in addition to the Colliseum building which it formerly occupied. It will therefore be very apparent that the number of exhibits will be almost double the number of last year's show and therefore it will require double the amount of space to describe the exhibits. Of course, as has been our practice in the past, as will devote most of our attention to describing the new productions. It would be impossible for us to describe everything, and as many of our readers will be familiar with many of the articles shown, through having seen them described in these columns heretofore, we will, in such cases, merely direct their attention to the previously printed descriptions and devote our space to giving complete particulars of new things which have not previously been described by us.

Those who have not been subscribers during the past six months or more, would do well to start their subscribtions with the back numbers, as in that way they will obtain complete descriptions of everything on the American market for the 1906 season. We have been making a practice of describing the 1906 models of cars and new parts and accessories during the past six months or more, which descriptions, of course, we will not repeat, merely directing our readers attention to them.

As our stock of back numbers is rapidly becoming exhausted, we advise those who desire them to subscribe immediately, starting their subscription as far back as they may desire. Subscription blank will be found on page 444.

American Cars for American Buyers.

A comparison of American motor cars with foreign motor cars as to their fitness for use in America is in many respects similar to a comparison between the American locomotive and the foreign locomotive for use on American railroads. It is not at all necessary to enter into any question as to the quality of the material or workmanship embodied in the foreign locomotive to answer a question as to its suitability for American use, for it has been clearly demonstrated that foreign locomotives are utterly unsuited to meet the peculiar conditions of American railroads, more particularly the numerous curves and sharp grades and heavy loads, the foreign locomotive is too rigid and its efficiency confined along too narrow lines to enable it to accomplish anywhere near the results which are accomplished by the more flexible American locomotive which has been designed on the ground, so to speak, by engineers who are in touch and fully conversant with the requirements which they have to meet.

An exactly similar condition exists as to the motor car. A foreign designer is necessarily governed by conditions with which he is familiar. He is not at all familiar with the exceedingly rough and heavy roads of America, but he does design his cars with a view to producing the best results over smooth roads and the hard road surfaces of Europe. It is not a criticism of the material and workmanship of foreign cars to say that the car is not capable of giving an American owner the best results when used on American roads. The American designer has been face to face with the conditions of American use; he has also had the advantage of constant observation of the shortcomings of foreign cars when asked to meet American conditions, and he has now had ample time in which to avail himself fully of this observation and experience, and the results are plainly apparent in the best of the American cars.

Then again, as to the purely mechanical side of the question, the American engineers have had to the fullest degree the benefit of all that has been accomplished and studied in Europe. Our designers and manufacturers are in very close touch with the developments of Europe, and it is only due to the European engineers to state that the American engineers have learned a great deal of value from them. We think it is safe to state that the American engineer has studied the progress of foreign development with an entirely unprejudiced mind and has been able to sort out all that was of value for use in America.

Another point which we consider has a marked influence on the superiority of American cars is that the best of them are built in new modern factories, which are equipped with the very latest and best American special machinery, with the result that the quality of the workmanship produced is duced is in every respect superior. It has become proverbial that American motor car manufacturers have availed themselves to the fullest extent of all that is most up to date and of acknowledged superiority in shop practice. Another point, the result of which we think is plainly apparent, is that American engineers and manufacturers have not been at any time during the growth of the business handicapped by old traditions. We believe that the result of this condition is very apparent in the best American product. We believe that one of the greatest advantages enjoyed by the American engineer is that he is on the ground and through direct personal experience must necessarily be accurately informed as to American requirements. We do not believe it possible for designers and manufacturers whose trade has been built up and whose success has been made in meeting requirements that are altogether different from American, to produce a car which will best meet American needs.

It may seem improbable to some that American makers have, in the period of a few years, been able to overtake the lead secured by foreign makers, but we believe that those who are familiar with the enterprise and up-to-dateness of American manufacture of all lines, and who especially are in touch with the exceeding keenness of competition and sharp rivalry for excellence which is proverbial in the motor car trade, can very readily understand the situation. Certain it is that American makers have availed themselves of every advantage including that of being able to learn much from the long experience of foreign builders.

So far we have treated wholly of the relative excellence, or perhaps more properly, the superior suitability of American design to meet American conditions. That the American design is most suitable to meet American conditions, has we think been most fully proven by the only real proof that is available, that is the proof of actual hard service in the hands of the average owner.

To turn to the subject of quality, we believe that no well-informed engineer would to-day question the statement that all things considered, the best American product now shows a superiority over anything else in the world. This is only a natural outgrowth of those methods of manufacture which originated and have developed in America and which have become known throughout the world as "American." Through experience and observation, the American manufacturer has gained knowledge and confidence. At first he did not attempt to build cars to compete in quality with the leading cars of the old established foreign makers, but year by year the American maker has undertaken more ambitious projects and has year by year approached and finally overtaken and passed the foreign maker. That close attention to detail and that careful selection of materials which has made the American watch, the American rifle, the American sewing machine, and on up to the American battleship the acknowledged superiors to similar products of other countries is in evidence in the best American motor cars, showing superiority to the best products of other countries.

If the above statements are accepted as true—and there is certainly ample evidence to demonstrate their truth—then no reason exists why an American should purchase a car of foreign manufacture. This statement is made in the abstract and without any reference to the relative first cost or relative after cost. It is possible, both because of the item of import duties and of economies of American manufacturing methods, to place the American built car on the market at a price far below that at which a foreign car of similar specifications can be sold. The very keen competition among American manufacturers has resulted in this fact being utilized to the utmost. The price of high grade American cars has been kept down to a surprising degree. When one compares the American price in America with the price which he must pay for a foreign car purchased directly at the foreign factory, the contrast in favor of the American car is most significant.

The subject can appropriately be summed up in a few words by the statement that today, not only is there no reason why an American owner should go abroad for his car, but further it is a well established fact that he can procure from the best home manufacturers a car which is, not only in design, much better adapted to meet the requirements of American service, but is also intrinsically of better quality. more accurate manufacture and superior finish. The above statements are made wholly independent of the price question, but are intended to apply to a critical consideration of the cars on their merits alone.

There appears to have been a sort of imaginary halo surrounding the names of some foreign cars, and doubtless many American owners have purchased their cars largely with a thought of prestige which would come to them from their using of such cars. Even this consideration has lost its value, if it ever had any, for certainly the work which the best American cars have done side by side with the best foreign cars not only in America but in Europe as well, has given the American cars in question a prestige not surpassable by anything.

In this article we have considered purely the relative merits of the cars themselves and have not introduced into the argument anything in relation to the added convenience of owning an American built car and as to the great advantages possessed by American cars of all matters relating to repairs and maintenance. The advantages of American cars on these points, is certainly so obvious as to require no argument. L. W. CONKLIN.

How Foreign Cars Obtained Their Reputations.

In a recent issue a New York paper ran on its editorial page an interview with Charles M. Schwab. former president of the United States Steel Corporation, in which, under the heading, "America's Industrial Problem," Mr. Schwab was quoted as saying:

"Yet it is notorious that American automobiles have not ranked as high as European automobiles. The truth is that we have hitherto made no genuine effort to produce forged steel working parts of automobiles of the highest quality. That is one of the reasons why our automobiles have not ranked as high as those of foreign make."

As this seems to be the general opinion, naturally fostered and encouraged by foreign competitors, it seems time that the American, proud of home industry, should be informed of the actual facts, which, upon investigation, will convince the most sceptical that quality of material has been the smallest influence.

It is true that in the transmission parts and in the axles and in possibly one or two of the minor details the foreign manufacturers have had, in the past, a slight advantage. It has enabled them to use smaller shafts and gears for the transmission, but that does not matter. American roads demand heavier mechanism and we have used the larger shafts and gears at an expense of some eight or ten pounds which has been more than saved elsewhere.

There are several reasons why American automobiles have not, in the past, ranked as high as those of foreign makes, quality of steel being the smallest.

The leading reason is due to the fact that the American manufacturer spent many years in experimenting before reaching his final conclusions. In the earlier stages of the industry, he used electricity as his motive power; then for one or two years steam was the popular power. After that he switched off to horizontal gas engines.

In the meantime, the foreign manufacturer had adopted the style of vertical motors in front, now practically the universal design, and this gave to them the advantage of a start of several years on the American manufacturer. The chief advantage of the vertical design is its minimum of weight and its ready accessibility for examination and repairs, in those days a most important advantage.

Another great reason why the foreign cars were considered superior is that the makers of them first saw the necessity of and introduced high power. This was not so much for the purpose of gaining excessive speed as it was for the negotiating of hills and bad roads without overtaxing the engine and other mechanism. Higher power was not only contributory to the pleasure of the owner but also eliminated, to a large extent, the expense of repairs and delays on the road.

During this transition period the American maker was using barely enough power to send his car over ordinary roads, and if the valves were foul or any slight derangements occurred his car could not climb hills or overcome bad roads. Under the same conditions the foreign cars would continue to operate at fair speed. This has all been remedied now. The Amerian manufacturers are using greater power and are more than holding their own under all conditions of travel to which their cars are subjected.

Still another reason for the belief that the foreign cars are superior to those of American make is the high prices asked for them. But these high prices are due entirely to the fact that a number of middlemen share the profits and not because of any greater intrinsic value or better workmanship.

To sum it all up the foreign cars have been sold to a certain class of Eastern buyers mainly because they alone catered to the demand for high power, roominess and comfort, and because they were a year ahead of us in perfecting their permanent designs. Design, speed, power and size have been the causes, not an imaginary lower grade of materials or workmanship.

This is proven in our own case. Last year we made and sold four hundred high powered and roomy cars. As a consequence, this year it has become necessary to erect a new factory with a capacity of one thousand fifty horse power machines which will seat seven people and make a mile a minute.

The time for the American manufacturer to supplant his foreign rival on his home grounds has come.

E. R. THOMAS.

Permanent Organization of Automobile Trade Credit Association.

At a meeting held on November 29th in New York City, the Automobile Trade Credit Association was permanently organized. As a number of concerns in the business were unable to attend the meeting, a circular letter of advice has been sent out stating in general what was done at the meeting. All concerns connected with the trade are being urged to join the association in order to render it an effective medium of defense and detection in the line of placing credits. It is desired to make it so strong in prestige that an irresponsible buyer will find it impossible to impose upon dealer after dealer as is now frequently the case, but will encounter opposition before his career has very far progressed. In the present condition of affairs, the trade is almost entirely at the mercy of unscrupulous customers, who exhaust their credit with one concern and then turn to another repeating the operation over and over again because it is impossible to determine the credit of many of these customers, as mercantile agencies do not rate them, or else ratings are founded on inaccurate and unreliable statements. References are also frequently concerns favorable to the credit-securing customer.

Upwards of 60 representative concerns were present at the November meeting, and all expressed their faith in the future success and great good which could be accomplished by the organization. A certificate of incorporation was executed and has been filed. Resolutions and by-laws to cover the detailed workings of the association were adopted. A board of directors was elected as follows: F. J. Alvin, Mgr. American Elec'l Novelty & Mfg. Co. New York; L. C. Burnet, with Truffault-Hartford Susp. Co., New York; E. Willis, President E. J. Willis Co., New York; Geo. W. Nock, individual dealer, Phila.; Jas. E. Murray, Mgr. N. Y. Sporting Goods Co., New York; L. L. Halle, with Sibley & Pitman, New York; Carl Kaufman, Treas. Motor Car Equipment Co., New York; Harry B. Mirick, Treas. Natn'l Elec. Supply Co., Washington, D. C., which in turn met after the meeting and elected the following officers: F. J. Alvin, President of the Association; L. C. Burnet, Treasurer; Franz Neilson, Secretary and Counsel. The secretary has been authorized to issue blanks and attend to all details of getting the organization in due working order.

Briefly outlined, the by-laws provide that the Association shall aid in the collection of accounts, collect and disseminate information concerning the standing of customers, protect against unjust and unlawful claims and exactions, settle differences between its members and between members and customers and promote a more cordial feeling among those engaged in the trade.

The dues are $40.00 a year, payable semi-annually in advance and each member in joining must pay for one share of stock at $5.00, which requirement is adopted in order to meet the requirements of the business corporation laws. An initiation fee of $10.00 must be paid by those who do not join the Association within the next 30 days. The aims of the Association will be obtained by means of a system of interchange of information through the secretary's office, which system has been found successful in other trades.

The 1906 Glidden Trophy Tour.

The 1906 A. A. A. tour for the Glidden Trophy will start from Buffalo July 23, stopping at Niagara Falls, then crossing into Canada and along a fine old gravel road through St. Catherines, Grimsby and Hamilton to Toronto, where the first night stop will be made and where the tourists will be the guests of the Toronto Automobile Club.

The route then leads over the famous Kingston road, the best macadamized road in Canada, passing through Whitby, Oshawa, Bowmanville, Port Hope, Coburg, Belleville and other old Canadian towns to Kingston.

The Thousand Islands will occupy a day, and the tour will then proceed through Brockville and Prescott to Ottawa, the Canadian capital. After a night's rest there they will go on to Montreal and along the St. Lawrence River to Quebec, then to Poland Springs, Me., through New Hampshire and the White Mountains to Bretton Woods for a day's rest. Then traversing Vermont to Lake Champlain, they will proceed to Saratoga, Albany and along the Hudson to New York, making in all about a fourteen hundred mile trip.

The Two New York Shows.

The Armory Show Building an Architectural Marvel.

The new Armory of the Sixty-ninth Regiment, in which the Automobile Club of America will hold its sixth annual show, will be opened to the public for the first time when the Auto Show opens, on January 13 next. This building is an immense assembly hall, altogether without an architectural parallel, its design and construction being marked throughout by interesting departures from established practice, departures necessitated chiefly by the several requirements, of large and unobstructed floor space, ample light and complete fireproofness. To these ends the main portion of the edifice consists of an enormous drill hall with floor 189x202 feet, housed under a gigantic curbed covering, which is sustained by six semicircular steel arches. There is no real distinction between roof and wall—the latter consisting, so to speak, of the lower portions of the former. The height from the floor measures under the arches 100 feet.

The ends of the drill hall are closed by brick work, that at the rear, constituting a solid wall, while the front is made notable by what is asserted to be the largest brick arch in the world—the opening through it being ninety feet wide by 68 feet high and its outside dimensions 190 x 116 feet. An ample basement extends under the entire building, except under the unexcavated middle portion of the floor of the main hall, under which there is no basement except around the edges.

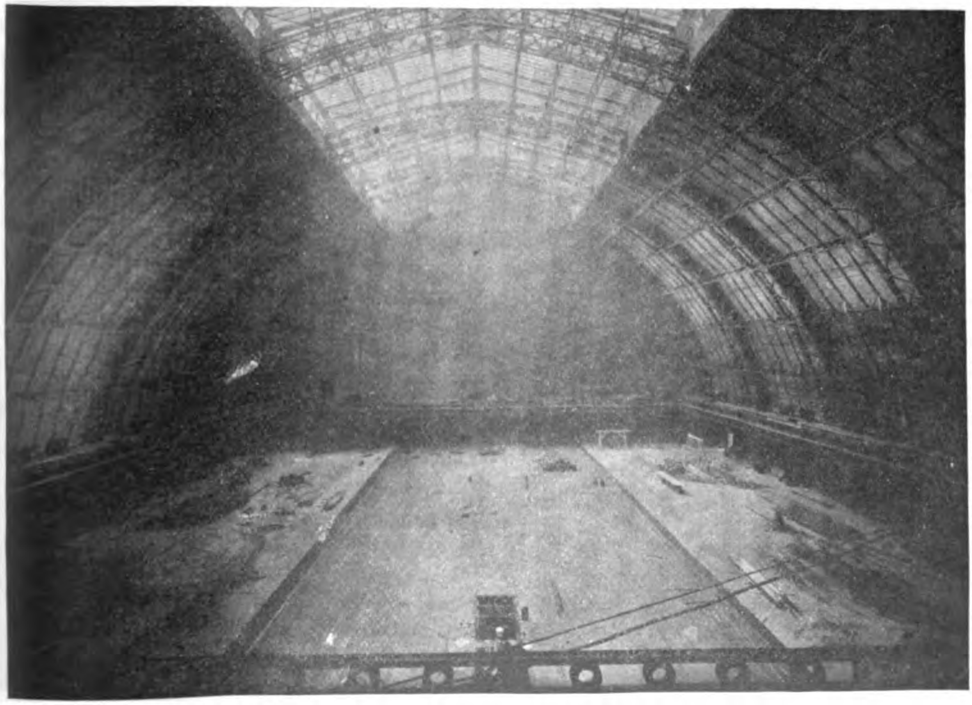
A skylight along the top of the main curved roof, extending down some distance on either side, insures abundant light during daytime hours.

Arc and incandescent lights afford night illumination on a liberal basis and the steam heating plant is adequate to the severest demands that may be made upon it.

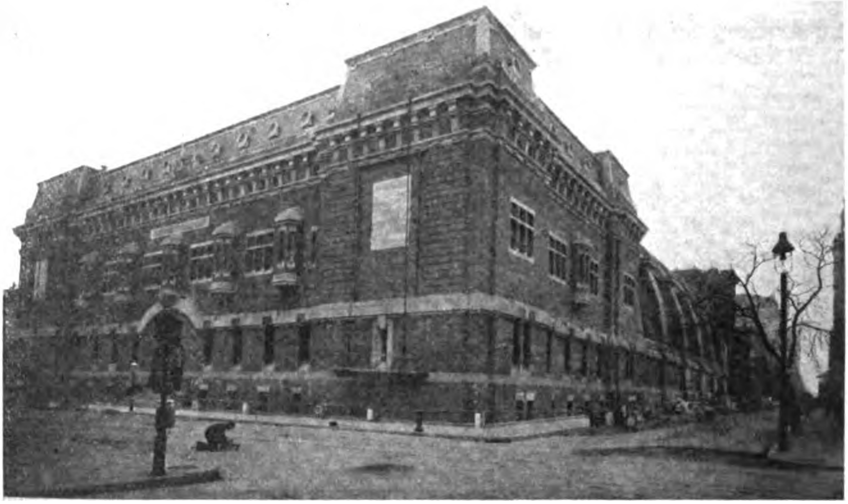
Around the edges of the main floor, at a sufficient height above it, and with no supporting pillars to obstruct the floor, there is an ample gallery, which nominally is only sixteen feet wide, is being widened to eighteen feet and floored over with level planking. The main floor likewise is being planked over with hardwood, this minor work accounting for an unfinished appearance that has been evident in recent photographs.

The total floor space available for the automobile show is 152,500 square feet, an amount exceeded by but a few buildings in the world.

The outside dimensions of the building are 197 feet wide on Lexington avenue, 305 feet deep on Twenty-sixth street and 335 feet deep on Twenty-fifth street, running back to within 100 feet of Fourth avenue. The Twenty-sixth street entrance to the new home of the Automobile Club's show is less than 300



The interior of the Armory Building in which the Automobile Club of America's Sixth Annual Show will be held. Possibly the largest building without pillars in the world, giving a total of 152,500 square feet of floor space.



The exterior of the Armory Building, Twenty-fifth and Twenty-sixth streets and Lexington avenue, New York City, which will house the Sixth Annual Show of the Automobile Club of America, one block from Madison Square Garden, the tower of which is seen in this illustration.

feet from the old location wherein the five previous annual club shows were held, and is within two blocks of Broadway and of the centre of the city.

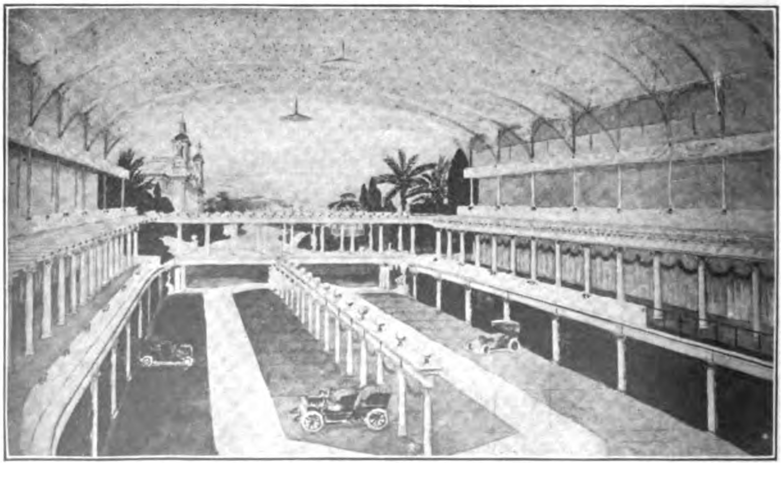
An absolutely new feature of this year's show, and which will add an interest not possessed by it in previous years, is to be the exhibit of the Aero Club of America, which was founded recently by a number of the same people who were prime movers in the foundation of the Automobile Club of America, and who have hopes of being able to do as much for aerial navigation as they have for highway transportation.

In this section of the sixth annual show of the Automobile Club of America there will be exhibited every important development in aerostation that this country has brought forth, besides much of the most interesting work of foreign inventors. There will be balloons, dirigible airships, parachutes, aeroplanes, meteorological instruments and an exhibit of materials and accessories.

Beautiful Decorative Scheme Adopted for Madison Square Garden.

The cut herewith gives an excellent idea of the scheme of decoration which will prevail at the Madison Square Garden Show January 13-20.

The color scheme is white and gold with proper enrichment by contrasting colors. Large plaster or staff columns ten feet apart, supporting the classic cornices, will contain signs of each exhibitor. The entire cornice



View of Madison Square Garden, illustrating the decorative scheme adopted for the automobile show January 13-20. The idea is not to destroy the individuality of the exhibits but to harmonize them so that when viewed as a whole the show will be a beautiful composite and not a heterogeneous mass of exhibits.

will be illuminated by thousands of electric lamps contained in a reflector, and this, together with new electroliers, especially made for the purpose, will make the Garden at night as light as day.

At the entrance will be the heroic emblem containing the figure that has been used as a poster. Under it will be a fountain of running water, on which will be played different colored lights, making a novel and attractive feature upon entering.

The staff composition has a brilliant whiteness that should contrast beautifully with the other materials used. Upon the wooden flooring will be laid 5,000 yards of a thickly-padded carpet of a rich golden bronze color. At the entrance to the lobby a forest effect will be in evidence, giving one the impression of natural, wild beauty, and this same forest effect is to be carried into the restaurant and basement. The entire ceiling space of the Garden will be covered with a canopy of sky blue tone, from which golden stars will flash. The rear of the Garden will be covered with a special scenic painting representing an Italian garden.

A mammoth private telephone exchange will be in operation, and each exhibitor at the show can conveniently telephone to other exhibitors or elsewhere. There will be sixty-five trunk lines from the Garden and more than four thousand calls per day can be handled.

Classified List of Exhibitors at the two New York Shows

(Addresses will be found in Buyers' Guide page 509)

Accessories.

Boyle & Co., John (Club Armory Show). License hangers.
Fine, Horace E. (Madison Square Show). License hangers.
Gilbert Mfg. Co. (Madison Square Show). Auto covers.
Hall, E. L. (Madison Square Show). Hampers.
Hatch & Brittin (Madison Square Show). Emergency case.
King, Julius, Opt. Co. (Madison Square Show.) Goggles.
Patterson, Gottfried & Hunter. (Mad. Sq. Show.) Tool kits.
Prest-O-Lite Co. (Both Shows). Compressed gas tanks.
Scandinavian Fur & Leather Co. (Club Armory Show). Clothing.
Utility Co. (Madison Sq. Show). Cleansing compounds, spark plugs, etc.
Veeder Mfg. Co., Hartford, Conn. (Both Shows). Odometers.
Way Muffler Co. (Madison Sq. Show). Throat Mufflers.

Ball Bearings.

American Ball Bearing Co. (Both Shows.)
Hess-Bright Mfg. Co. (Both Shows)

Bodies.

Hooke, Henry & Co. (Madison Square Show.)
Springfield Metal Body Co. (Both Shows.)

Carburetors.

American Generator Co. (Club Armory Show.)
Bryne, Kingston & Co. (Both Shows.)
Holley Bros. Co. (Madison Square Show.)
Richard, Francois. (Club Armory Show.)
Wheeler, F. H. (Madison Square Show.)

Castings.

Bethlehem Steel Co. (Madison Square Show.)
Cramp, Wm. & Sons. (Both Shows.)
Light Mfg. and Foundry Co. (Both Shows.)
Manufacturers' Foundry Co. (Madison Square Show.)
Midvale Steel Co. (Madison Square Show.)

Chains.

Baldwin Chain and Mfg. Co. (Both Shows.)
Diamond Chain and Mfg. Co. (Both Shows.)
Whitney Mfg. Co., The. Hartford, Conn. (Both Shows.)

Differentials.

Brown-Lipe Gear Co., Syracuse, N. Y. (Both Shows.)
Warner Gear Co., Muncie, Ind. (Both Shows.)

Electric Automobiles.

Auto-Car Equipment Co., The. (Club Armory Show.)
Babcock Electric Carriage Co. (Madison Square Show.)
Baker Motor Vehicle Co. (Club Armory Show.)
Cantono Electric Tractor Co. (Madison Square Show.)
Columbus Buggy Co. (Madison Square Show.)
Lansden Co. (Club Armory Show.)
Rauch & Lang Carriage Co. (Club Armory Show.)
Vehicle Equipment Co. (Club Armory Show.)
McCrea Motor Truck Co. (Club Armory Show.)

Gasoline Automobiles.

Acme Motor Car Co. (Club Armory Show.)
Aerocar Co., The. (Club Armory Show.)
American Darracq Auto Co. (Madison Square Show.)
American Locomotive Auto Co. (Club Armory Show.)
American Peugeot Auto Co. (Club Armory Show.)
Apperson Bros. Auto Co. (Madison Square Show.)
Archer & Co. (Club Armory Show.)
Ardsley Motor Car Co. (Club Armory Show.)
Austin Automobile Co. (Club Armory Show.)
Autocar Co., The. (Madison Square Show.)
Auto Import Co. (Madison Square Show.)
Bartholomew Co., The. (Club Armory Show.)
Berkshire Automobile Co. (Club Armory Show.)
Bertelli & Co. (Club Armory Show.)
Blomstrom, C. H., Motor Co. (Club Armory Show.)
Bowman Auto Co., Sidney B. (Madison Square Show.)
Buckeye Mfg. Co. (Club Armory Show.)
Buick Motor Co. (Madison Square Show.)
Cadillac Auto Co. (Madison Square Show.)
Central Park Auto Storage Co. (Club Armory Show.)
Charron, Girardot & Voigt. (Club Armory Show.)
Cleveland Motor Car Co. (Club Armory Show.)
Commercial Motor Car Co. (Club Armory Show.)
Corwin Motor Vehicle Co. (Club Armory Show.)
Crawford Automobile Co. (Club Armory Show.)
Cryder & Co. (Club Armory Show.)
Daimler Mfg. Co. (Club Armory Show.)
Dale, Mendel & Co. (Club Armory Show.)
Dayton Motor Car Co. (Club Armory Show.)
Decauville Auto Co. (Madison Square Show.)
De Dietrich Importing Co. (Madison Square Show.)
Dolson, John H., & Sons. (Club Armory Show.)
Dorris Motor Car Co. (Club Armory Show.)
Duryea Power Co. (Club Armory Show.)
E. H. V. Co. (Club Armory Show.)
Electric Vehicle Co. (Madison Square Show.)
Elmore Mfg. Co. (Madison Square Show.)
English Daimler Co. (Club Armory Show.)
Ford Motor Co. (Club Armory Show.)
Franklin Mfg. Co., H. H. (Madison Square Show.)
Gallaher, E. B. (Club Armory Show.)
Gallia Electric Carriage Co. (Madison Square Show.)
Grout Bros. Auto Co. (Club Armory Show.)
Haynes Auto Co. (Madison Square Show.)
Hewitt Motor Co. (Madison Square Show.)
Hicks Automobile Co. (Club Armory Show.)
Hollander & Tangemann. (Madison Square Show.)
Iroquois Iron Works. (Club Armory Show.)
Iroquois Motor Car Co. (Club Armory Show.)
Jackson Automobile Co. (Club Armory Show.)
Jeffery, Thos. B., & Co. (Club Armory Show.)
Knox Automobile Co. (Madison Square Show.)
Turning Mills).
Knox Motor Truck Co. (Club Armory Show.)
Lear, Oscar, Automobile Co. (Club Armory Show.)
Lewis & Matthews Co. (Club Armory Show.)
Locomobile Co. of America. (Madison Square Show.)
Logan Construction Co., The. (Club Armory Show.)
Lozier Motor Co. (Club Armory Show.)
Marion Motor Car Co. (Club Armory Show.)
Matheson Motor Car Co. (Madison Square Show.)
Maxwell-Briscoe Motor Co. (Club Armory Show.)
Mason, Norris N. (Club Armory Show.)
Mitchell Motor Car Co. (Club Armory Show.)
Moline Automobile Co. (Club Armory Show.)
Moon Motor Car Co. (Club Armory Show.)
Moore Automobile Co. (Club Armory Show.)
Mors Automobile Co. (Club Armory Show.)
Napier Motor Co. of America. (Club Armory Show.)
National Motor Vehicle Co. (Club Armory Show.)
Nordyke & Marmon Co. (Club Armory Show.)
Northern Mfg. Co. (Madison Square Garden Show.)
Olds Motor Works. (Madison Square Garden Show.)
Packard Motor Car Co. (Madison Square Garden Show.)
Palais de L. Automobile. (Auto Club Armory Show.)
Palmer & Christie. (Auto Club Armory Show.)
Panhard & Levassor. (Auto Club Armory Show.)
Peerless Motor Car Co. (Madison Square Garden Show.)
Pierce, The Geo. N., Co. (Madison Square Garden.)
Pope Mfg. Co. (Madison Square Garden.)
Pope Motor Car Co. (Madison Square Garden.)
Premier Motor Mfg. Co. (Auto Club Armory Show.)
Pungs-Finch Co. (Auto Club Armory Show.)
Railway Appliances Co., The. (Both Shows.)
Rainier Co., The. (Auto Club Armory Show.)
Rapid Motor Vehicle Co. (Auto Club Armory Show.)
Renault Freres Agency, Inc. (Auto Club Armory.)
Reo Motor Co. (Auto Club Armory Show.)
Richard-Brasier. (Auto Club Armory Show.)
Royal Motor Co. (Madison Square Garden Show.)
St. Louis Motor Car Co. (Auto Club Armory Show.)
Smith & Mabley, Inc. (Madison Square Garden Show.)
Stearns, F. B., Co. (Madison Square Garden.)
Stevens, J. B., Arms and Tool Co. (Madison Sq. Garden.)
Studebaker Auto Co. (Madison Square Garden Show.)
Thomas, E. R., Motor Co. (Madison Square Garden.)
Twyford Motor Car Co. (Auto Club Armory Show.)
Viqueot Co., The. (Auto Club Armory Show.)
Walker Motor Car Co. (Auto Club Armory Show.)
Walter Automobile Co. (Madison Square Garden Show.)
Waltham Mfg. Co. (Madison Square Show.)
Wayne Automobile Co. (Auto Club Armory Show.)
Welch Motor Car Co. (Auto Club Armory Show.)
Werner, Oscar. (Auto Club Armory Show.)
Western Tool Works. (Auto Club Armory Show.)
Windsor Automobile Co. (Auto Club Armory Show.)
Winton Motor Carriage Co. (Madison Square Garden.)
Wolverine Auto and Com. Veh. Co. (Auto Club Armory.)
York Automobile Co., The. (Auto Club Armory Show.)

Gasoline Engines.

Aster Co., The. (Auto Club Armory Show.)
Brennan Mfg. Co. (Madison Square Garden Show.)

Gasoline Storage Tanks.

Bowser, S. F., & Co., Inc. (Both Shows.)
Hydraulic Oil Storage and Dis. Co. (Madison Sq. Gard.)
Iron Clad Mfg. Co. (Both Shows.)

Hoods, Radiators, etc.

Briscoe Mfg. Co. (Both Shows.)
Kinsey Mfg. Co. (Auto Club Armory Show.)

Horns.

Gabriel Horn Mfg. Co. (Both Shows.)
Hutchison Electric Horn Co. (Auto Club Armory Show.)

Ignition Apparatus.

American Elec. Nov. and Mfg. Co. (Madison Sq. Garden.)
Anderson Spark Plug Co. (Madison Square Garden.)
Atwater-Kent Mfg. Co. (Madison Square Garden Show.)
Autocoil Co., The. (Madison Square Garden Show.)
Champion, Albert, Co. (Madison Square Garden Show.)
Conn. Telephone and Elec. Co. (Auto Club Armory.)
Dayton Electrical Mfg. Co. (Both Shows.)
Eastern Carbon Works. (Both Shows.)
Hardy, The R. E. Co. (Both Shows.)
Heinz Electric Co. ((Madison Square Garden Show.)
Herz & Co. (Madison Square Garden Show.)
Mosler, A. R., & Co. (Madison Square Garden Show.)
Motsinger Device Mfg. Co. (Madison Square Garden.)
National Carbon Co. (Both Shows.)
National Sales Corporation. (Madison Square Garden.)
Pittsfield Spark Coil Co. (Madison Square Garden.)
Poly-Phase Ignition Co. (Madison Square Garden.)
Remy Electric Co. (Both Shows.)
Rubay, Leon. (Madison Square Garden Show.)
Semi-Dry Battery Co. (Madison Square Garden Show.)
Sibley & Pitman. (Madison Square Garden Show.)
Splitdorf, C. F., Co. (Both Shows.)
Uncas Specialty Co. (Both Shows.)
Witherbee Igniter Co. (Both Shows.)

Jacks.

Cook's Railway Appliance Co. (Auto Club Armory Show.)
Duff Mfg. Co. (Madison Square Garden Show.)
Oliver Mfg. Co. (Both Shows.)
Roth Jack and Tool Co. (Madison Square Garden Show.)

Jobbers.

Auto Accessories Mfg. Co. (Madison Square Garden.)
Auto Supply Co. (Madison Square Garden Show.)
Dac Automobile Supply House. (Both Shows.)
Judson Co., The J. G. (Both Shows.)
Manhattan Storage Co. (Madison Square Garden Show.)
Miller, Chas. E. (Both Shows.)
Motor Car Equipment Co. (Both Shows.)
New York Sporting Goods Co. (Madison Square Show.)
Post & Lester Co. (Madison Square Garden Show.)
Willis, E. J., Co. (Both Shows.)

Lamps.

Atwood Mfg. Co. (Madison Square Garden Show.)
Badger Brass Mfg. Co. (Both Shows.)
Dietz, R. E., Co. (Both Shows.)
Edmunds & Jones Mfg. Co. (Both Shows.)
Funke, A. H. (Madison Square Garden Show.)
Gray & Davis. (Both Shows.)
Ham, C. T., Mfg. Co. (Madison Square Garden Show.)
Rose Mfg. Co. (Both Shows.)
Rushmore Dynamo Works. (Madison Square Garden.)

Lubricants.

Columbia Lubricants Co. of N. Y. (Both Shows.)
Harris, A. W., Oil Co. (Both Shows.)
Havemeyer Oil Co. (Madison Square Garden Show.)
Miller's, Wm. P., Sons. (Auto Club Armory Show.)
N. Y. & N. J. Lubricant Co. (Both Shows.)
Vacuum Oil Co. (Madison Square Garden Show.)
Young, Orlando W. (Madison Square Garden Show.)

Lubricators.

Auto Brass and Aluminum Co. (Madison Square Garden.)
Greene, Tweed & Co. (Madison Square Garden Show.)
Lunkenheimer Co. (Madison Square Garden Show.)
Madison-Kipp Lubricator Co. (Auto Club Armory Show.)
McCord & Co. (Both Shows.)
National Sales Corporation. (Madison Square Garden.)
Steel Ball Co., The. (Both Shows.)

Metal Polishes.

Allers, H. A., & Co. (Madison Square Garden Show.)
Hollingshead, R. M., Co. (Auto Club Armory Show.)

Miscellaneous.

Brown, F. M. (Auto Club Armory Show.)
Cooper-Hewitt Electric Co. (Madison Square Show.)
Prosser, Thomas, & Son. (Both Shows.) Steel.
Safety Elec. Elevator Co. (Both Shows.) Elevators.
Shelby Steel Tube Co. (Both Shows.) Steel tubing.
Standard Welding Co. (Both Shows.) Electric welding.

Motor Cycles.

Consolidated Mfg. Co. (Madison Square Garden Show.)
Curtiss, G. H., Mfg. Co. (Auto Club Armory Show.)
Hendee Mfg. Co. (Auto Club Armory Show.)
Wagner Motor Cycle Co. (Auto Club Armory Show.)

Paints and Varnishes.

Sherwin-Williams Co., The. (Auto Club Armory Show.)
Smith, Edward, & Co. (Madison Square Garden Show.)
Valentine & Co. (Madison Square Garden Show.)

Parts.

Aurora Auto. Mach. Co. (Both Shows.) Motor cycle outfits.
Barnes Gear Co. (Madison Sq. Show.) Steering gears.)
British Westinghouse Elec. Co. (Club Armory Show.)
Brown, W. H. (Auto Club Armory Show.) Dust shields.
Carpenter Steel Co. (Madison Sq. Show.) Forgings.
English & Mersick Co. (Madison Sq. Show.) Hardware.
Gas Engine Whistle Co. (Madison Sq. Show.) Whistles and air brake.
Gray-Hawley Mfg. Co. (Club Armory Show.) Muffler.
Janney-Steinmetz Co. (Madison Sq. Show.) Tanks.
Morgan, B. (Both Shows.) Engine valves.
Ofeldt, F. W., & Sons. (Club Armory Show.) Boilers.
Parish & Bingham Co. (Both Shows.) Pressed steel frames.
Spicer Universal Joint Mfg. Co. (Both Shows.)
Ventilated Cushion Co. (Madison Square Show.)

Publications.

Automobile, The. (Both Shows.)
Automobile Topics. (Auto Club Armory Show.)
Cycle and Automobile Trade Journal. (Both Shows.)
Horseless Age. (Both shows.)
Motor. (Both Shows.)
Motor Age. (Both Shows.)
Motor Way, The. (Both Shows.)
Motor World. (Madison Square Garden Show.)
Survey Map Co. (Auto Club Armory Show.) Maps.

Pumps.

Gleason, Peters, Air Pump Co. (Club Armory Show.)
Imperial Brass Mfg. Co. (Madison Square Garden.)
Noera Mfg. Co. (Madison Square Show.)
Wray Pump and Register Co. (Madison Square Garden.)

Radiators.

Mayo Radiator Co., The. (Auto Club Armory Show.)
Whitlock Coil Pipe Co. (Both Shows.)

Roller Bearings.

Hyatt Roller Bearing Co. (Both Shows.)
Standard Roller Bearing Co. (Both Shows.)
Timken Roller Bearing Axle Co. (Both Shows.)

Shock Absorbers.

Diezeman Shock Absorber Co. (Madison Square Garden.)
Hartford Suspension Co. (Both Shows.)
Sheddan Mfg. Co. (Auto Club Armory Show.)

Speedometers.

Jones Speedometer Co. (Madison Square Garden Show.)
McGiehan Mfg. Co. (Both Shows.)
Motor Car Specialty Co. (Madison Square Garden Show.)
Rollins Mfg. Co. (Auto Club Armory Show.)
Warner Instrument Co. (Both Shows.)
Webb, The, Co. (Both Shows.)

Steam Automobiles.

Johnson Service Co. (Auto Club Armory Show.)
Lane Motor Vehicle Co. (Auto Club Armory Show.)
White Sewing Machine Co. (Auto Club Armory Show.)

Storage Batteries.

Edison Storage Battery Co. (Auto Club Armory Show.)
National Battery Co. (Madison Square Garden Show.)

Switches.

Auto-Lock Plug Co., Inc. (Auto Club Armory Show.)
Goebel, F. A. (Auto Club Armory Show.)

Tires.

Consolidated Rubber Tire Co. (Auto Club Armory Show.)
Continental Caoutchouc Co., The. (Both Shows.)
Diamond Rubber Co., The. (Both Shows.)
Ever-Lastic Tire Works. (Auto Club Armory Show.)
Firestone Tire and Rubber Co. (Both Shows.)
Fisk Rubber Co., The. (Both Shows.)
G. & J. Tire Co. (Both Shows.)
Goodrich, The B. F., Co. (Both Shows.)
Goodyear Tire and Rubber Co., The. (Both Shows.)
Hartford Rubber Works Co. (Both Shows.)
International A. and V. Tire Co. (Both Shows.)
Michelin Tire, American Agency. (Madison Sq. Garden.)
Milwaukee Rubber Wks. Co. (Madison Square Garden.)
Mitchell Punctureless Tire Co. (Club Armory Show.)
Morgan & Wright. (Both Shows.)
Pennsylvania Rubber Co. (Both Shows.)
Republic Rubber Co. (Both Shows.)
St. John Rubber Tire Co., The. (Auto Club Armory.)
Samson Leather Tire Co. (Madison Square Garden.)
Swinehart Clincher Tire Co. (Madison Square Show.)
Voorhees Rubber Mfg. Co. (Madison Square Garden.)

Tire Protectors and Anti-Skids.

Mesinger, H. & F., Mfg. Co. (Madison Square Garden.)
Post Mfg. Co. (Auto Club Armory Show.)
Republic Rubber Tire and Shoe Co. (Both Shows.)
Weed Chain Tire Grip Co. (Madison Square Garden.)

Tops.

Auto Cover and Top Mfg. Co. (Madison Square Garden.)
Detroit Motor Car Supply Co. (Both Shows.)
Duane, W. J., & Co. (Madison Square Garden Show.)
Manhattan Auto Top Co. (Madison Square Garden.)
New York Carriage Top Co. (Madison Square Garden.)
Springfield Auto Top Co. (Madison Square Show.)
Hill Mfg. Co., The. (Auto Club Armory Show.)
Rands Mfg. Co. (Both Shows.)
Sprague Umbrella Co., The. (Both Shows.)
Teel, E., & Co. (Auto Club Armory Show.)

Transmissions.

Belden Auto Transmission Co. (Both Shows.)
Gearless Transmission Co., The. (Auto Club Armory.)

Trimmings.

Lackawana Leather Co. (Madison Square Gorden Show.)
Mutty, L. J., Co. (Madison Square Garden Show.)
Pantasote Co. (Madison Square Garden Show.)

Wheels.

Jones, Phineas & Co. (Madison Square Garden Show.)
Midgley Mfg. Co. (Madison Square Garden Show.)
Schwarz Wheel Co. (Madison Square Garden Show.)

The Florida Races.

The question is often asked in regard to the Ormond-Daytona, Florida Beach, what is the cause or secret of its great speed qualities and its superb condition as an automobile course and how long has the beach been known.

The oldest inhabitant will tell you that their memory goes back fifty years or more and the beach is now as it was when they were children and mingled with the Indians that were more or less numerous along the Florida East Coast. The fathers of the oldest inhabitants told them that the beach was the same broad expanse of level white hard sand as it is now when they were boys. They will tell you of fearful storms that have lashed the Florida East Coast around Ormond and Daytona in years gone by, which brought on their wings death and destruction, but the beach, when calm prevailed again, was the same level, hard beach, the walking or driving on which leave no imprint other than a band of a white mark.

The beach itself, or that portion of it used during the automobile races, extends from above Ormond to the Matansas Inlet, twenty miles in length, the course passing Seabreeze and Daytona, where the club house of the Florida East Coast Automobile Association is located on the beach. At low tide that is 300 or more feet of good hard driving surface, and it is so hard that a four-ton solid tire automobile bus leaves no rut or mark on it other than a faint white streak. The racing is always scheduled to begin when the tide is half out and care is taken to select dates so as to have the racing at suitable hours.

In 1902 W. J. Morgan inspected the beach and the beach was found to be good and the winter of 1902-3 saw the first automobile races given on the now famous Ormond-Daytona Beach. and demonstrated beyond a doubt that this course was king for automobile racing.

The 1903-4 tournament saw W. K. Vanderbilt, Jr., win the crown as speed king when he did his mile in the then phenomenal time of 39 seconds flat.

Last winter saw Mr. Vanderbilt lose the crown, as it was taken by H. L. Bowden, of Boston, who made the wonderful time of 32 4-5 seconds, using two engines coupled together for the feat.

What will be done during the coming fourth annual meet January 22 to 27, is hard to guess, but it is predicted in all quarters of automobiling that the mile in 30 seconds and the two miles in a minute is not an impossibility on the Ormond-Daytona Beach. Several cars are being built, the contract price for which depending on the cars being able to do the two miles in a minute. Europe will send their best drivers including Lancia, of Italy; Hemery, of France; Clifford Earp, of England, and many others to do battle with our undoubtedly fast improving brigade of daring American drivers. It will be a battle of the giants of speed and the world will undoubtedly see in January time that has never been equalled before by any agency, either by wing or wheel, and it is safe prophecy to predict that all records for the world of all descriptions by any means will be eclipsed from one to 100 miles January 22 to 27. It is also certain that a large attendance of spectators will be gathered on the famous beach to see the International speed clash of arms. The Florida East Coast Automobile Association are making great preparations for the coming meet and President Asa Paine is already on the ground directing affairs locally.

The interest in the Florida races is worldwide and many visitors from distant points will journey there to see them. The Seaboard Air Line is running special trains from New York at the close of the automobile shows, and the fact tnat the automobilists of Detroit, Boston, Philadelphia and other cities will each have special cars indicates the large number that will journey to Florida this year. Special rates are also made by the Clyde Steamship Co. and the Florida East Coast Railway.

These races will be followed by motor boat races and automobile races at Havana, Cuba, February 8 to 13, for which the city of Havana has appropriated $5000 for prizes.

W. K. Vanderbilt on the Ormond-Daytona Beach.

Philadelphia Annual Automobile Show.

The 1906 Philadelphia annual automobile show, Feb. 24 to March 3, will be held in the National Export Exposition Building in West Philadelphia, if a sanction is granted the Philadelphia Automobile Trade Association, who are promoting the show. Shipping to this building can be very conveniently done, as the tracks of the P., B. & W. Railroad, a Pennsylvania line, are within a few feet of the east doors of the building.

At a meeting on November 20 the Philadelphia Automobile Association joined with the Philadelphia Automobile Trade Association, and the consolidation will hereafter be known by the latter title. This gives the organization a membership of nineteen actives and five associates, all of whom will help to promote the annual show. The officers of the older organization were in authority until the regular annual election, which was held on December 5, when the officers for the ensuing year were elected as follows: A. E. Maltby, president; G. S. Smith, vice-president; I. J. Morse, secretary. A board of directors, consisting of W. F. Smith and Daniel Cohen, was appointed.

February 24th to March 3 will be the date for the annual Philadelphia Automobile Show instead of March 3 to 10 as first decided. This change was adopted at a recent meeting of the Philadelphia Automobile Trade Association where also Chester I. Campbell was selected to manage the details of the show, under the general direction of the show committee appointed by president Maltby at the meeting before.

1906 Cars Described in Detail

The Cycle and Automobile Trade Journal has described more 1906 cars in detail than all other automobile publications combined. With those printed in this issue the total will reach almost 80 descriptions.

In our June, 1905, we described 2 1906 models.
In our July, 1905, we described 3 1906 models.
In our August, 1905, we described 4 1906 models.
In our September, 1905, we described 7 1906 models.
In our October, 1905, we described 10 1906 models.
In our November, 1905, we described 14 1906 models.
In our December, 1905, we described 13 1906 models.

The February issue will contain, in addition to the complete illustrated account of everything new shown at the two New York shows, complete detailed descriptions of all the remaining cars of importance on the American market. We will therefore have accomplished the feat of illustrating and describing in detail every 1906 model of American motor car before the opening of the season.

Those who have not been subscribers heretofore can start their subscription with any number from June, 1905, as long as we have on hand copies of the back numbers. The supply of several of the back numbers is almost exhausted and we therefore urge immediate action in case you desire your subscription to include any of them. You will find subscription blank on page 444 of this issue.

Local Shows.

The following local shows in addition to the New York shows, January 13-20, and the Chicago show, February 3-10, have been sanctioned by the National Association of Automobile Manufacturers, Inc., also that of the Denver Automobile Association, which will be held some time in April, the exact date not having been selected:

Washington Auto Dealers' Association, Inc., February 3-10.
Tri-State Sportsmen's Association, Detroit, February 12-17.
Cleveland Dealers' Auto Company, February 19-24.
Buffalo Automobile Trade Association, March 5-10.
Boston Auto Dealers' Association, March 10-17.

The Philadelphia, Pa., and Baltimore, Md., dealers have also applied for sanction to hold shows this spring, and dates will probably be allotted to them later.

Cycle Manufacturers' Association Formed.

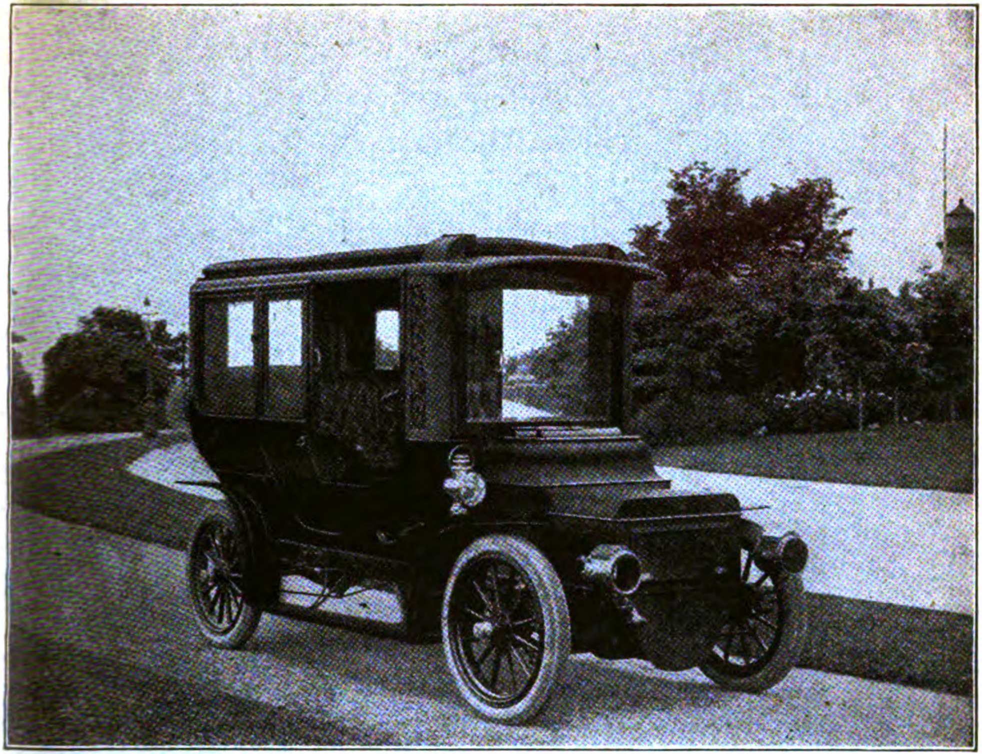
While in conference in Hartford, November 21, over the recently settled Bottom Bracket suit, the bicycle manufacturers organized the Cycle Manufacturers' Association, in which George Pope, chairman, Harry Walburg and F. E. Southard were constituted a committee to draft the constitution and by-laws for presentation at a meeting which was held on Monday, December 11, at 10 o'clock A. M. at the Auditorium Annex, Chicago. W. H. Crosby was elected temporary chairman and A. L. Pope temporary secretary. All makers whose annual output exceeds 1000 bicycles are eligible, also all manufacturers of motor cycles.

William H. Crosby was elected president at the meeting for completing the organization of the association, which was held at Chicago on December 11. George N. Pierce, of Buffalo, was elected vice-president; D. W. Gould, Pope Mfg. Co., Chicago, secretary, and Harry Walburg, Miami Cycle and Mfg. Co., Middletown, Ohio, treasurer.

Ajax Automobile Tires.

Members of the American Motor Car Manufacturers' Association have formed the Ajax Standard Rubber Co., which has established a factory at 420-430 East 106th street, New York City. They have, at present, temporary headquarters at 2 Hudson street, New York City, and are about ready to deliver tires in standard clincher form, but will confine their business for the present to their stockholders. Horace de Lisser, who was formerly with the International Automobile and Vehicle Tire Co., is general manager of the business. All tires they make will be of first-class construction, made after formulae which have proved practical.

J. A. Cramer, a well-known Buffalo dealer, was recently elected president of the Buffalo Automobile Trade Association at the annual meeting, held in the Teck Theatre. W. C. Jaynes was elected vice-president, D. H. Lewis secretary, John J. Gibson treasurer, and P. W. Eigner, E. C. Bull and N. P. Baker on the executive committee.



The Johnson Auto-Carriage

THE BEST VEHICLE
FOR THE BEST PEOPLE

Johnson Service Company

BOSTON NEW YORK CHICAGO

Factory Milwaukee

The Johnson Auto-Carriage

Is the latest word in the Automobile line. It is the New Steamer. Full of novelty, with no freaks. Simplest of all. Easiest and cheapest to operate. Nothing to do while running it but to enjoy yourself

Write for Particulars

Johnson Service Company

BOSTON NEW YORK CHICAGO

Factory Milwaukee

If you want Elegance
If you want Pleasure
If you want Comfort
If you want Dependability
If you want Durability
If you want Simplicity

You Want
The Johnson
Auto-Carriage

Johnson Service Company

BOSTON NEW YORK CHICAGO
Factory Milwaukee

Who We Are

We were incorporated in 1885; just coming of age now and not a babe in mechanics. All the world knows of us. If you do not, write to us and we will reply fully.

Among good things we make the AUTO-CARRIAGE. What is the price? Just write and find out. If you want the best you will write and get the price and other information.

Johnson Service Company

BOSTON NEW YORK CHICAGO

Factory Milwaukee

The Moline 1906 Cars

HUGH DOLNAR.

The Moline Automobile Company, East Moline, Illinois, U. S. A., incorporated in 1904, has erected substantial factory buildings at East Moline, in a district which has a wide reputation for metal manufactures, and which may be confidently looked to in the near future as a great producer of motor wagons. The Moline Automobile Company has, so far, produced three models of cars. The first was placed on the road in February, 1904. This model was named the "Moline Touring Runabout," detachable tonneau body, wheel base 74 in., wheels 30x3½ in, motor horizontal pair of opposed cylinders 4½x4½ in, four-cycle, water-cooled, planetary speed change, chain to divided rear axle, weight 1400 pounds, price $1000. Fifty of these first Moline cars were produced in 1904.

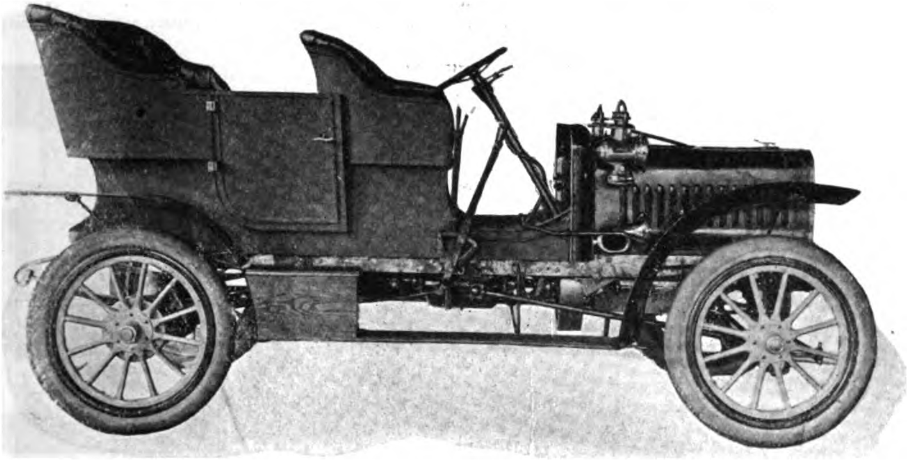


Fig. 1. The Moline 1906 Model "C," side entrance touring car, for four passengers, can carry five. Wheel base 100 in., gauge 56½ in., wheels 32x3½ in.; motor, four cylinders tandem, 3¾x4½ in.; sliding gear three speeds forward and reverse, and bevel gear to rear axle. The side entrance door is wide, rear seat 44 in., clear width inside of upholstering; weight 1800 pounds, price $1750, including mats, horn, two oil lamps and a full and complete tool equipment much superior to that usually given, including everything likely to be needed on the road.

During the season of 1905 the first Moline car, improved in many details and having its wheel base augmented to 86 in., was offered as Moline Model "D," fifty of them being made and sold, and has been again improved and will be offered in 1906 as "Moline Model "G," with these specifications:

Moline Automobile Company's 1906 Model "G," wheel base 86 in., gauge 56½ in., wheels 30x3½ in. rear, and 30x3 in. front; motor, a pair of horizontal opposed cylinders, dimensions increased to 4¾x5 in., weight 1600 pounds, detachable tonneau body for four passengers, can carry five. The price of this car has been placed at $1000, including mats, horn, two oil lamps and a full tool equipment.

The Moline Company's first four-cylinder car was on the road in December, 1904, and fifty of these cars, known as "Model B," were made and sold in 1905. The wheel base was 105 in., gauge 56½ in., wheels 32x3½ in., vertical and tandem, under hood in front, planetary speed change, bevel gear to divided rear axle, detachable tonneau body for five passengers, weight 1900 lbs., price $1600.

For 1906 the Moline Company will offer three models, as follows:

Model "G," detachable tonneau, four passengers, price $1000.

Model "C," four-passenger tonneau, four-cylinder motor, sliding speed change and bevel gear drive, price $1750.

Model "A," five-passenger side entrance tonneau body touring car, very fine, wheel base 110 in., gauge 56½ in., wheels 34x4 in.; motor, four vertical cylinders tandem, 4½x4, sliding speed change, three speeds forward and a reverse, bevel gear drive to divided rear axle, two rear hub brakes on each rear wheel, weight 2400 pounds, price $2500, including mats, horn, two oil lamps and tools.

This new Moline Model "A," which will not be ready for the 1906 New York Show, but which it is hoped to exhibit at Chicago, will be in every particular as good, elegant and luxurious as the Moline Company can produce, although the price has been fixed so low as $2500. The car will not be extremely large, but the wheel base adopted, 110 in., is long enough to ride well on any roads, and more than long enough for crowded streets, and gives plenty of room for five passengers, with space for baggage. The motor driving this fine car is of the first order, cylinders and pistons ground, piston rings ground on three surfaces, ignition by jump spark and storage battery, Hill Precision Oiler, all plain bearings except front wheels, which are on ball bearings, ⅝ and ¾ in. balls, rear axles and propeller shaft on roller bearings, with ball thrust bearings. The whole motive system of this car will be of well tried elements whose durability has been abundantly proved by extended use, the Moline Company preferring reliability of performance and certainty of action to possible advantages not fully assured, which might be gained from untried novelties.

The Model "C" is the only Moline 1906 car sufficiently advanced to be fully illustrated, at the date of this writing, December 16, 1905, and is here described in some detail for the first time.

The Moline 1906 Model "C" is a side entrance touring car for four passengers, can carry five. Its wheel base is 100 in., gauge 56½ in., wheels 32x3½ in.; motor, four cylinders tandem, 3¾x4½ in.; sliding gear, three speeds forward and reverse and bevel gear to rear axle. The side entrance door is wide, rear seat 44 in., clear width inside of upholstering. Weight 1800 pounds, price $1750, including mats, horn, two oil lamps and a full and complete tool equipment, much superior to that usually given, including everything likely to be needed on the road.

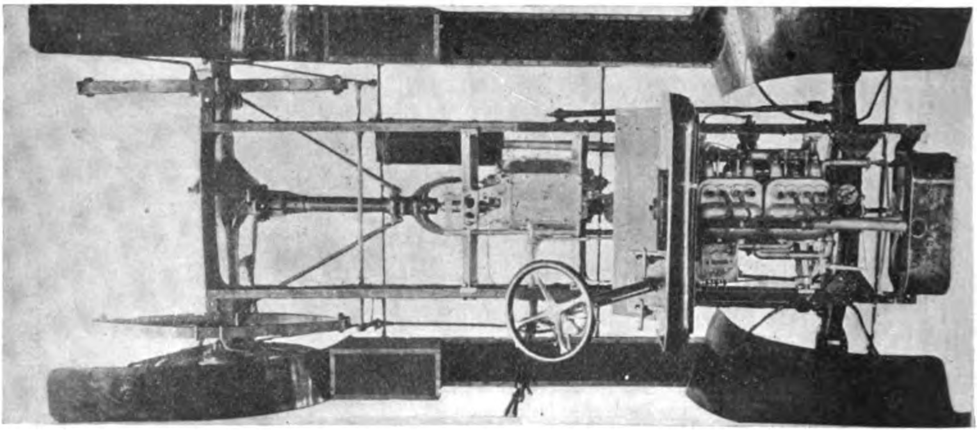


Fig. 2. Moline 1906 Model C, chassis plan; over all 109 in., width 27 in. parallel; greatest side depth 4 in.; cross spring in front, full elliptics in rear; rear spring hangers and rear chassis frame cross member form one integral steel casting; one channel section pressed steel cross member over front spring, gussetted, as shown. This chassis frame has only these two cross members, all cold rivetted. The aluminum motor base lugs are fitted inside and on top of the frame sides, and same with the gear box lugs, of which that in front is integral with box base, while that in the rear is applied to the box and finished as if all lugs were integral, to fit inside, and hang on, frame sides.

For a full touring equipment, including top, with full side curtains and storm front, pair of gas lamps with brackets and independent generator, odometer (total and trip), extra tire complete with cover and brackets to carry same and an extra storage battery. In addition to the foregoing list, the price of this Moline Model "C" is fixed at $2000, it being the intention to carry this venture into superlatives and make it absolutely and undeniably the finest, best and most completely appointed small touring car offered at its price for the season of 1906.

NOTABLE FEATURES.

The thing to first attract the attention of the experienced observer in the design of this car is the adoption of full elliptic scroll springs in the rear, and a wide heavy cross half elliptic spring in front. This spring arrangement gives the principal practical advantages of three point suspension and fully protects the car body from those destructive twisting strains which are inseparable from any four-spring arrangement, whether half-elliptic or full elliptic, where the chassis frame is one single structure with fixed members only. This full elliptic springs behind with the cross half elliptic in front cannot transfer individual wheel lifts to the chassis frame and body, and practically reduces front wheel lifts and drops by one-half their vertical extent before transferring them to the chassis frame. The rear wheel lift and drop is far better taken by full elliptics than by half elliptics, and by scroll head springs than by button heads, and the Moline Model "C" rides as would be expected, as smoothly and with as little side sway, body twist and tossing of passengers as the road surface and speed permit, and if driven under a twenty-mile rate will carry its passengers comfortably anywhere.

It may be justly said here, that this form of car body spring support, two full elliptics in the rear and a half elliptic in front, having half the vertical action of the rear springs, bears rigid function analysis as well as any possible form of elliptic springing, where only a single chassis frame is used.

As to power and transmission, the cylinders are well finished, and with sixty-five pounds compression have ample maximum power to push this light car, while for close throttling on the level, the piston area is enough to give full economy.

The drive from the crank shaft to the drivers is all in the most approved 1906 manner, sliding gear, plain bearings up to the propeller shaft and precision oiling, assuring a maximum expectation of reliability.

Ignition is of the very simplest form, with the best elements known in the trade, jump spark plugs, coils of most approved construction and the best storage battery.

The control is extremely simple, is interlocking to the extent of making it impossible for an inexpert driver to damage the gearing, and having both the ordinary and emergency brakes applied where they will do the least harm, to the rear wheel hubs directly. A brake is a motor car necessity, but it must be borne in mind that it involves a mechanical contradiction. The motor is built with the one intention of pushing its drivers to propel the car forward; the brake is placed to nullify the normal action of the whole car, and should not be so placed as to vex the propulsion system needlessly; in other words, the brake shoes should be applied as near the wheel tire and road surface contact as possible, instead of transmitting the brake effect through a long chain of vital elements to the rear wheels, and thereby adding enormously to the wear and tear of the hardest worked pieces in the motor wagon.

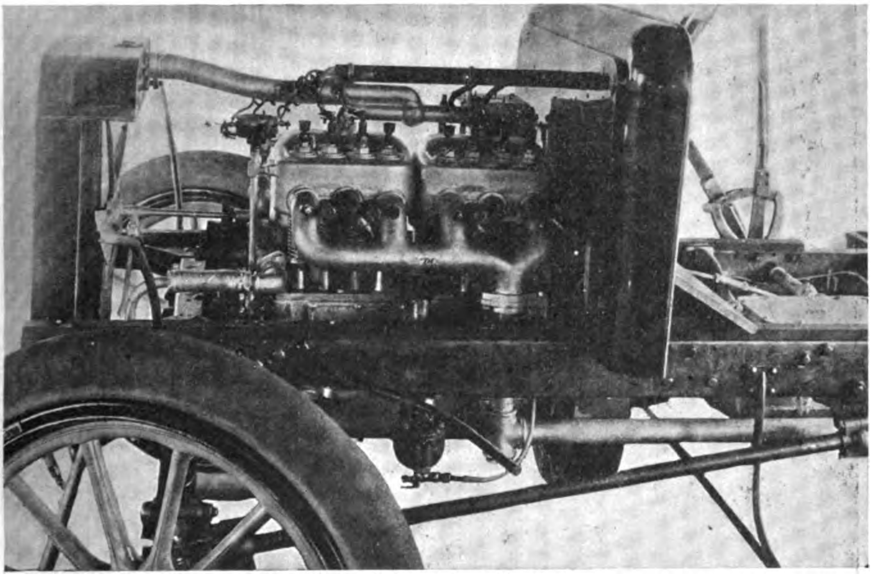


Fig. 3. Moline 1906 Model C, motor left side.

THE ENGINE.

The cylinders, see Fig. 6, are cast in dual units, with two exterior exhaust passages, one from each exhaust valve direct, and one exterior intake opening branching to the two intake valves, which permits placing one Y pipe from the carburetor, each single top branch of which supplies the two cylinders of one unit.

The spark plugs are screwed into the intake valve chamber screw caps, and the priming cups are screwed into the exhaust valve caps.

The valve heads and stems are integral nickel steel drop forgings, 45 degree angle, interchangeable, all 1½ in. diameter ports. The cams are steel, hard, applied to the cam shaft, taper pin retention, rivetted. A bronze and rawhide pinion on the crank shaft drives the grey iron cam shaft gear. The centrifugal pump, see Fig. 8, is driven two to one gear multiplication from the cam shaft, making the circulating pump rate same as crank shaft. The fan is gear driven from the pump pinion, two turns to one crank shaft turn. This does away with all belt driving. A belt drive is one of the best drives known in experienced hands; machine designers, therefore, are prone to place belts in their constructions, and have no trouble with them until they go into the hands of purchasers, who have not been used to belts all their lives and can and do find ways to make the belts give no end of trouble, so that no belt should ever be placed anywhere in an automobile. So long as water cooling is used the pump and fan will continue to be placed, and the Moline combination of a centrifugal pump and fan, all gear driven, is as good as can be placed.

The Moline pistons are slightly tapered, free in the cylinders, and have four rings, one over the piston pin and the other three above. The pins are solid tool steel, ⅞ in. diameter, hardened and ground, fixed in the pistons. The rings are 45 in. diameter angle lap, ground on three surfaces.

The general scheme of bearings in the Moline is bored and faced seats fitted with flanged cylindrical half boxes, finished inside and outside. The crank shaft and crank wrists are in nickel babbit bearings of this form. The rods are steel drop forgings and have bronze bushes forced into the solid piston end eyes, oil catch basins and oil hole on top, all splash lubricated. The wrist ends of the rods are full marine type, caps screwed hard on six thin liners, about 1-16 in. total thickness on each side, caps held by driven bolts, castellated nuts and split pine. These rod ends are bored and faced and fitted with nickel babbit half boxes, flanged, finished inside and outside, and interchangeable. Moline compression is sixty-five pounds.

The clutch is a leather faced cone, 15½ in. diameter, 1⅝ in. effective leather face, with four flat double ended springs under the facing, giving eight points of gradual engagement contact. The male clutch member is aluminum, made as light as possible, of course.

In points of paint and polish, makers of cars built to sell are not usually deficient, however they may scamp workmanship and lower cost of materials to make a big show for little cost. The Moline Company is not so foolish as to belittle the value of high finish nor fine appearance, but it applies the finish to good materials treated with the very best workmanship, with the full intention of both making a brave showing and backing the good appearance of their cars by sound and honest and intelligent treatment of the best materials that can be had.

THE SPRINGS.

Scroll head full elliptic springs 42 in. long 1¾ in. wide, turn on the rear axles and are fixed at the top to a steel casting forming the rear chassis frame member. The front single half elliptic spring, shackled to hangers integral with the drop forged front axle yokes pinned and brazed into the steel tape iron axle ends is 42 in. long by 2¼ in. wide, ribbed and banded. This front spring has a clear drop of 12 in. over the front axle; the front spring is fixed to a pressed steel channel section frame crossgirt, the motor frame front end reaching nearly to this spring carrying cross member.

Two struts, globe joints on the front axle forks, extend about 36 in. back and slightly upward to flat joint drop forged brackets fixed to the bottom and outsides of the frame sides.

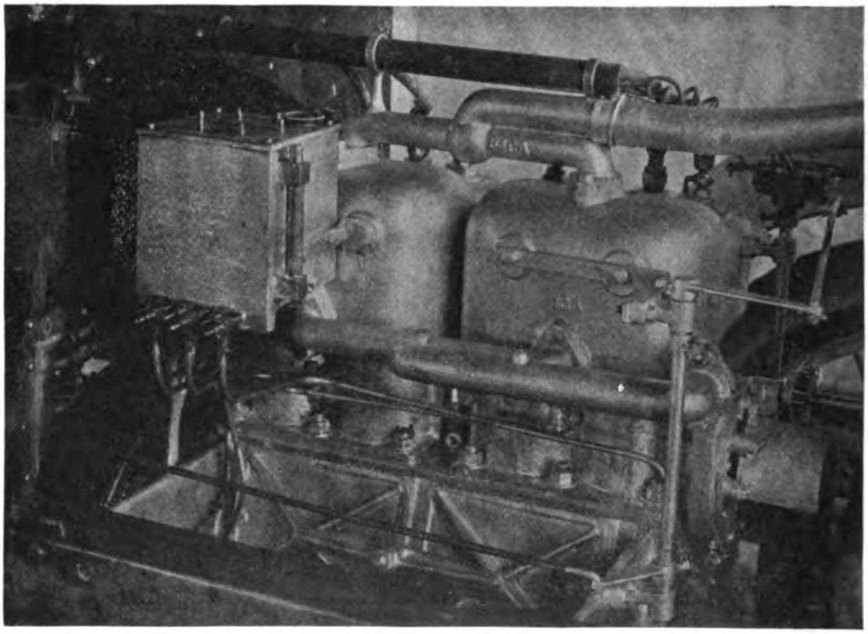


Fig. 4. Moline 1906 Model O, left side.

THE WHEELS AND AXLES.

The wheels, 32x3½, have malleable casting hubs, with applied pressed steel internal and external brake drums, 10 in. outside diameter, 9⅝ inside by 2 in. face, finished inside and out, fitted with Raymond brake bands outside and single piece internal toggle joint expanded bronze emergency brakes inside. The exterior ordinary bands are pedal applied. The rear wheels are applied directly to the rear axle tapered ends, with long keys, nut and split pin retention.

The front wheels are on two circles of ball bearings, ½ in. and ⅝ in. dia., on tool steel cones. The rear axles 1¼ in. dia., carried on Hyatt roller bearings with ball thrust bearings.

The front axle is a two-inch steel take, dropped 2½ in. The rear axle is two 2½ in. steel take sleeves, pinned and brazed into the capped globular bevel gear casing. The rear springs are revolvably mounted on the rear axle sleeves.

Two rear axle struts, non-adjustable, reach from near the rear axle ends forward and approach each other where they are fixed to a steel collar back of the steel yoke, which is jointed to brackets fixed to the rear of the aluminum casting change gear box supporting chassis member, in the central plane of the single Spicer universal joint which drives the propeller shaft. This telescopes in the spicer joint hub, and carries the bevel pinion on its rear end, and is carried on Hyatt roller bearings at the ends with a ball bearing at the rear to take the pinion thrust. This propeller shaft is 1 in. dia. and 38 in. long.

The bevel gear is 6 d. p. by 1¼ in. face, hardened. The balance gear is Brown-Lipe spur. The live rear axles are 1¼ in. dia., and are carried on two cages of Hyatt roller bearings with ball thrust bearings inside. The rear wheel hubs are applied to taper bearings with long keys and outside nuts.

THE CHASSIS FRAME.

See Fig. 2 and caption. The Moline Model "C" chassis is extremely simple, no sub-frame being placed, and the motor base lugs and gear box lugs forming the intermediate frame cross girts between that which takes the front spring, and the steel casting, which takes the rear springs and also forms the chassis frame rear cross member.

This simplicity of construction avoids many joinings of metal surfaces, and so increases the expectation of reliability, while reducing the labor cost.

One Spicer universal joint telescopes on the squared forward end of the propeller shaft, which is on Hyatt roller bearings at both ends, ball bearings to take pinion thrust. Diagonal struts, flat joints, on rear axle sleeve, pass through finished seats in integral yoke lugs, retained by castellated nuts and split pins at each lug end. The yoke is a steel casting, jointed to the applied gear box lug in plane of Spicer joint centre. The front board is pressed steel, wooden panel, and carries the spark coil box.

The front axle is supported by two struts, globe joints to axle sleeve, flat joints to steel brackets under frame sides. This is one of the simplest and most substantial of chassis frame constructions, the integral spring brackets and rear frame cross member making the fewest pieces in the rear spring assembly, while the channel section front cross members of pressed steel, gives ample strength for the cross spring support.

CONTROL (See Fig. 5).

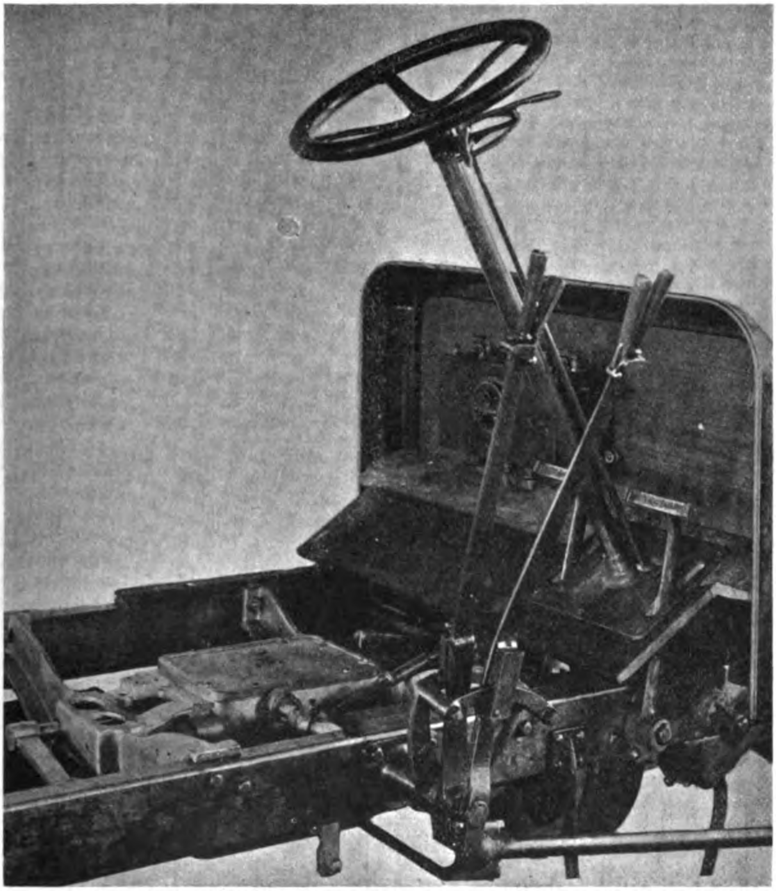


Fig. 5. Moline 1906 Model C, control. (Specifications in text.)

The clutch rocker is connected with one pedal and the outside emergency brake lever, which is latched to its quadrant. The right hand pedal applies the ordinary brake only and is not connected with the clutch rocker. The left hand pedal disengages the clutch and releases the change gear.

The latched outer lever when pulled backward first disengages the clutch and then applies the internal emergency brake shoes, incidentally also releasing the change lever.

The change lever is locked against movement so long as the clutch is engaged, and is latched to a five-notch quadrant.

Two small vertical pedals not shown in the illustration are placed to rear of the steering column, the right one is the accelerator and the left one works the muffler cut-out.

The Brown-Lipe steering gear is used. The

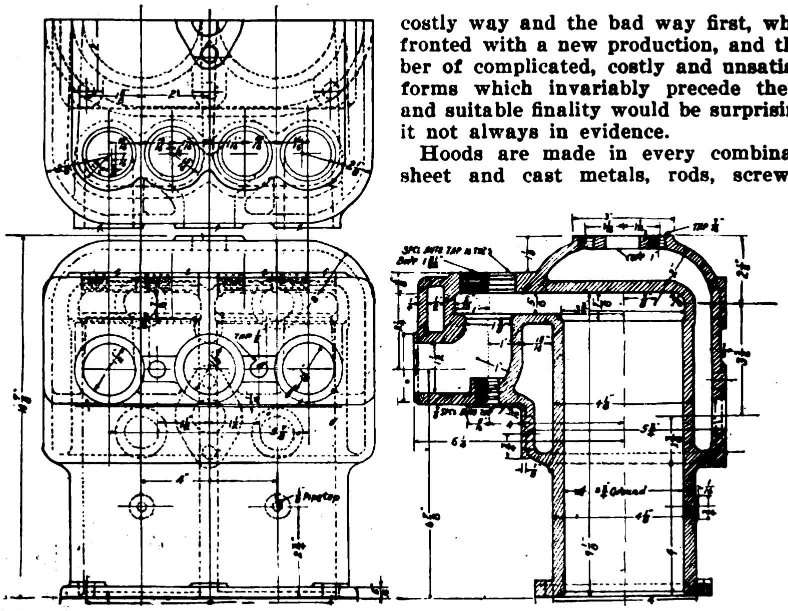


Fig. 6. Moline Model C cylinder, working drawing reproduction. The Moline cylinder finishing routine involves a rest period of thirty days between finishing all machine cuts and the final bore-grinding, which is on the new Heald cylinder grinding machine, cylinder held for grinding by the base flange only, bore horizontal, grinding by emery wheel, speed ⅞ mile per minute, water flooded. The Moline cylinders are not annealed after machining.

spark and throttle levers move horizontally to work two vertical rockers, sleeve and solid rod, having a common axis. The throttle hand lever movement must move the accelerator pedal, but the pedal movement does not affect the rocker.

THE HOOD.

Every designer chooses the hard way, the costly way and the bad way first, when confronted with a new production, and the number of complicated, costly and unsatisfactory forms which invariably precede the simple and suitable finality would be surprising were it not always in evidence.

Hoods are made in every combination of sheet and cast metals, rods, screws, nuts and split pins, and have even been offered with leather straps and buckles to keep the unstable elements together.

The Moline hood is one piece of sheet metal, bent to slide over the radiator, two lengthwise doors on top, and the lower edges rolled up in lengthwise scrolls or beads about 5-16 in. diameter, and these beads simply

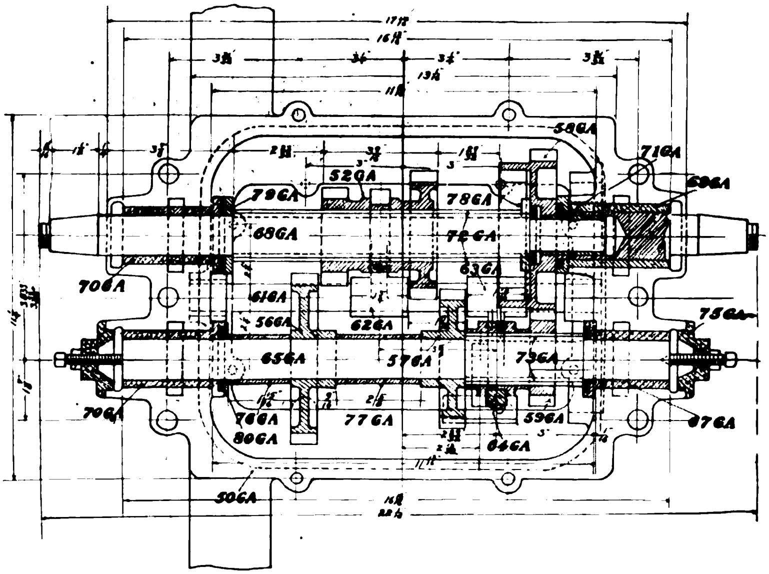


Fig. 7. Moline Model O change gear. This casing is an assemblage of four aluminum castings, the base of which is an oil well, the top box member integral with the front lugs and to which the rear lugs are applied, and the hand hole cover. The shafts are round with integral feathers, casing box seats bored and faced, shafts carried in nickel babbitt flanged split bushes, non-adjustable, finished inside and outside, interchangeable, with ring oilers. The gear box lugs reach across and hang on the chassis frame sides, and serve as frame girts. The action is non selective. The gearing is all hard, all standard 6 d. p. 13-16 face, gear holding faces ground after hardening. The gear shift rod is interlocked with the clutch disengagement action. The motion of the gear shifting lever is transmitted to the gear change sliding member through one single working joint.

slide under full length clips, making a "round dovetail" seating, which holds the thin sides both inwardly and outwardly. Studs on the rear ends of this one-piece hood pass through the front board, retained by bronze wing-nuts. The rear hood door opens for oiler access, and that in front opens to commutator and water tank. This hood can slide far enough forward to fully expose the motor, and yet be well supported in the slide ways.

The Moline Automobile is an offshoot from the Root and Van DerVoort Gas Engine Company, a very successful and constantly increasing business, founded in 1898, and at present working about 150 hands in two shifts covering twenty-two hours per day. The "R. and V." gas engines have an enviable reputation, so that the Moline car motors are the result of ripe and successful previous experience in gas engine construction.

ON THE ROAD.

December 16, at noon, the Moline 1906 Model "C" left the Moline shops, East Moline, bound on a 50-mile cruise under jury rig, tester's seat in front, no foot board, W. H. Van DerVoort, President and Chief Designer of the Moline Company, driving, with C. H. Van DerVoort, Moline Chief Tester, on a strapped-on cushion on top of a dead-weight box dos-a-dos, at rear of driver's seat, and Hugh Dolnar as front-seat passenger. The full elliptic rear springs looked tossy with no load, and the dead weight box with 150 pounds of cast iron nailed up inside was put on at the writer's suggestion; young Van DerVoort is no trifle, and it looked as if the rear springs would act about right with him and the 150 pounds of cast iron on top of them, but there was no place for his feet except on the end of the chassis frame, which brought the young man's knees up to his chin, and didn't look like much comfort, even if he stuck out and got through alive. So a piece of inch by ½ inch steel bar was bolted on for a foot rest. Each Moline is a roomy suburb, streets paved with natural Illinois black mud, which was frozen on this beautiful, brilliant 16th of December, into the roughest assemblage of ruts, bumps and hollows the writer ever rode over. The Moline Model C is fast and was flying light under the jury rig, and, as the writer had ascertained by private inquiry that Van Der Voort was not afraid to push his own work, the outlook appeared to be about ninety minutes for the fifty miles, and maybe a little bit better than that. But the run did not last anything like an hour and a half, and in fact Hugh Dolnar did not take out his watch to look at the time when he got off the car. Later, when he was lying on his back on the frozen road with one seat cushion under his head and another under his smashed left ankle he did look at his watch and it was exactly 12.15, start at 12 flat, total elapsed time fifteen minutes, total running time not taken.

Hugh Dolnar's notes, mental, of the run, were about like this: "Mighty spry car." Bounce! "Van don't need to be told to push her." Bounce! "Mud frozen mighty hard—roughest surface I ever met—wonder how the young fellow is sticking on behind. Wow! But that four-foot wide hog wallow across the road was a bouncer! All right behind? Hang on for the turn!" Hugh Dolnar meant a right-angle turn in the road just ahead, not the turn-over he thought the car made the next instant.

The writer sat on the outside and went with the tester's seat when it left its moorings in rounding the turn. Plenty of time to think. Hugh Dolnar wondered how hard the bump on the hard road would be and whether the chassis would fall on him when things settled down quietly.

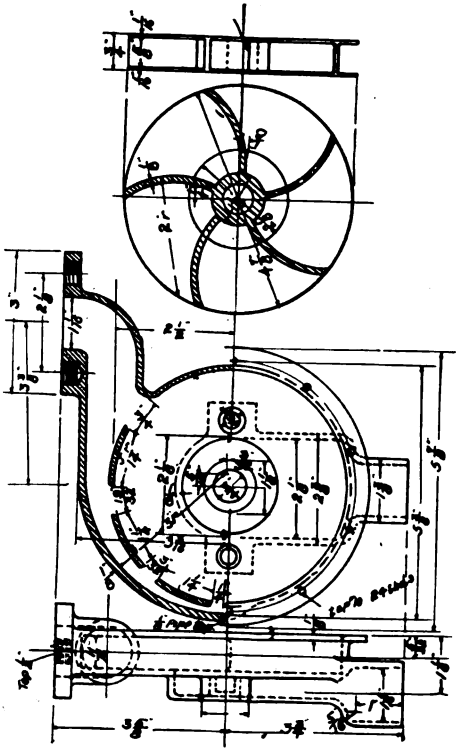


Fig. 8. Moline Circulating Pump. This is bronze, centrifugal type, having integral side plates which enclose the vanes, so as to obtain the maximum effect by reducing the friction of the mass of water passing the vanes. This construction is recognized as standard in large pumps of this class, but is believed to not have been before applied in automobiles. There are motor car builders who do not believe rapid water circulation needful, but it seems clear that, with a given cooling effect and a given heating effect the nearest approach to uniform low temperature of the entire system will be had with the most rapid movement of the heat transferring medium, or, in other words, that a given radiator will cool a given motor better with a rapid water circulation than with slow circulation. In proof of this seemingly self-evident proposition, the 1905 Moline cars had slow circulation pumps and often boiled the water in the radiator, while with the pump here illustrated the radiator cannot be made to boil by any working condition combination.

But all this was an error in Hugh Dolnar's observations. He was certainly there, but he didn't exactly know what was being done. The Moline Model C didn't turn over at all; it just stood there on the road quiet as a lamb, right side up, no seats, no passengers, the only much hurt one, and finally after every right as a trivett.

The constable who tried to arrest Van Der Voort for fast driving just before the Model O came to the hog wallow strolled up and looked on with much satisfaction, while poor Van Der Voort, the picture of miserable regret, was getting the shoe and stocking off erything was quieted down, doctors sent for, crowds gathered and opinions exchanged, the constable told us he saw the tester's seat supports give way when we bounced through the hog wallow, going about seventy-five miles an hour in his opinion. The turn was close by, and Van had the speed down to not over twenty miles when we rounded the curve, and of course, the seat slid off and dumped the historian into the road. Young Van Der Voort came, too, but he sprawled on the ground, rolled over two or three times and was not hurt at all. Van Der Voort, driver, held on to the steering wheel and stayed on the car.

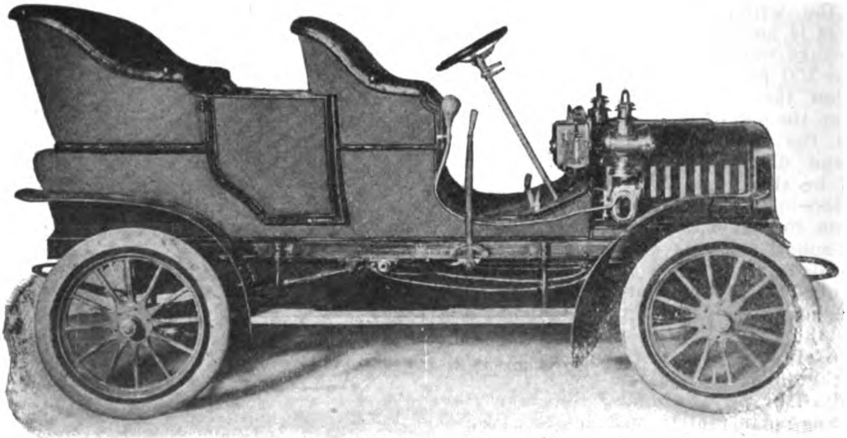
The first doctor to arrive was very cheerful. "Broken? I should say so—smashed all to bits. You'll never use that ankle again." The next one was more familiar with the situation. "Potts fracture," he remarked, after he had moved the fragments sufficiently to determine the precise line of separation. "Stiff joint? Has that tendency. Well, cannot certainly say. Four to six weeks, probably."

It began to look to Hugh Dolnar as if the January Journal was not to have so many new car stories in it as he had expected.

Things were brighter about 4 o'clock same day when Hugh Dolnar was a guest of the Hotel Moline Hospital, with a very notional-as-to-position left foot on two pillows, while Designer Van Der Voort was giving him the figures to complete the Moline Model O story.

The 1906 Auburn

Besides its strong, well constructed chassis, the 1906 Auburn car has a strikingly attractive feature in its handsome, roomy body, the manufacturers, Auburn Automobile Co., Auburn, Ind., claiming that in appearance it equals cars at double the price. The seats are large and are set at a comfortable distance apart. The hood is also well designed. The frame of this car is of angle iron, 2x3x¼ inch and all cross pieces are of angle iron, also a tubular roller bearing axle is used in rear and a solid square axle in front. . The frame rests on full elliptic springs at the rear and on semi-elliptics in the front: Thirty by 3½-inch tires are regularly supplied, but 32x4-inch ones may be had on order at additional cost. The tread is 56 in. and the wheel base 94 in.



The 1906 Auburn Car. Wheel base 94 in.; tread, 56 in.; 30 or 32-inch wheels; 3½ or 4-inch tires; angle iron frame; double opposed, 5x5, 20 H. P. engine; planetary transmission; weight 1750 lbs.; price $1250.

The 1906 Auburn is driven by a double opposed, 5x5, 20 H. P. water-cooled, gasoline engine. The valves are mechanically operated. A force gear pump circulates the cooling water. The valves are at the ends of the cylinders, permitting the admission of a full charge directly back of the pistons and giving the pistons the full benefit of the explosion, it is claimed. The burned gases also are expelled quickly and easily. The crank shaft is 1¾ in. in diameter. The wrist bearing is 2¼ in. and the main bearing next to the flywheel 3¼ in., all bearings being of the finest babbitt. The cam shaft is in the lower part of the crank case and runs in an oil bath. This placing of the cam shaft not only eliminates practically all wear, but also renders it unnecessary to remove the shaft to get at the wrist bearing. The pistons are of semi-steel, ground and polished and fitted with three rings, which are ground on faces and edges. Connecting rods are very large and are provided with oil grooves at the top, which convey oil to the wrist bearings. The jacketing provides a large water space about cylinders and valves. The valves are fitted in a cage and can be very quickly removed in case regrinding is necessary. All are interchangeable. A double throw gear pump forces the water through both cylinder jackets, at the same time insuring uniform and thorough cooling of both cylinders. Lubrication is automatic, and when the engine is running the crank chamber compression forces oil to the cylinder, wrist bearings and main bearings. A Kingston carburetor is used.

The transmission is of the planetary type with no internal gears. The drive is direct on the high speed with no gears in motion. Two forward speeds and a reverse are provided. Drive is by centre chain.

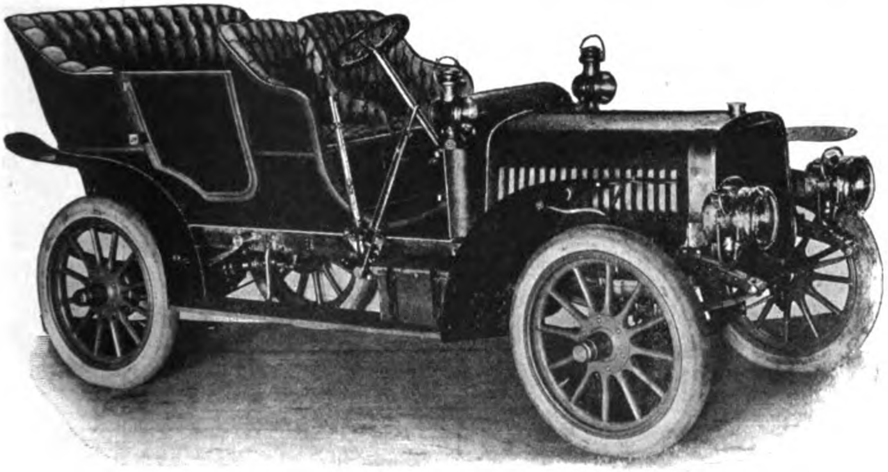
The car is easily controlled. One lever operates the two forward speeds and the reverse is thrown in by means of a pedal. The differential band brake is pedal operated. Speeds of from five to forty miles per hour can be had on the spark and throttle. The car is said to be capable of climbing an 18 per cent. grade on the high speed with four passengers up.

Gasoline and water tanks are carried in the hood, twelve gallons of gasoline and six gallons of water being carried.

The car weighs 1750 pounds and lists at $1250 with two oil lamps, horn and set of tools. The body is of the side entrance type and made of veneered wood. The doors are high and the body large, seating five. The body finish is royal blue, the gear finish primrose yellow.

Moon 1906 Model A.

Moon Motor Car Co., St. Louis, Mo., offer for 1906 a 2400-pound 30-35 H. P., 4-cylinder gasoline car, known as their Model A. This car has a King of Belgium side entrance body with seating capacity for five persons. The wheel base is 106 inches and 34 by 4-inch tires are used. The frame is of cold pressed steel and the spring hangers are drop forged. The engine is the well-known Rutenber. The transmission is sliding gear type and gives three forward speeds besides the reverse, drive being direct on the high speed. The drive is by bevel gears and shaft. The four cylinders are cast separately and are water-cooled. The cooling water is circulated through a honeycomb radiator. Cooling is assisted by a fan. Jump spark ignition is employed with batteries and coil. The clutch is of improved multiple disc construction. Speeds of from three to fifty miles an hour are obtainable. Three brakes are provided, two on the rear hubs and one on the transmission. The gasoline tank holds fifteen gallons. This car lists at $3000.



Moon Model A 1906 Car. Price $3000.

American Locomotive Motor Car.

The American Locomotive Co., of 111 Broadway, New York City, which recently engaged in the manufacture of motor cars at its Providence, R. I., plant, has organized a subsidiary company, "American Locomotive Automobile Co.," to handle this branch of its business. As has already been announced, this company will build an American reproduction of the Berliet, which is made at Lyons, France, and will be reproduced at the Providence plant with strict adherence to original factory drawings and patterns. In materials, workmanship and methods, the French products will be strictly followed.

This plan of manufacture will insure interchangeability of parts of both French and American productions, although the men in the respective factories will be 3000 miles apart. Thus, owners of American Berliet cars touring in France will find no difficulty in securing spare parts which will fit, nor will users of the French Berliet cars find any difficulty in getting repairs in this country.

The plant of the American Locomotive Automobile Co., at Providence, is a substantial steel and brick structure, three stories high, 375 feet long by 63 feet wide. The machinery is driven by electrical power, and is all of special construction. Two hundred cars of 24-30 H. P. and 40-50 H. P., four cylinders, will be turned out this year, and some 60-70 H. P. cars.

The Blomstrom Co.'s 1906 Queen Cars

HUGH DOLNAR.

The C. H. Blomstrom Motor Company, Detroit, Mich., had a very successful season with the Queen 1904 single cylinder and pair of opposed cylinder light cars, and, clearly foreseeing the future development of automobile manufacture, made plans for a large increase of production facilities to be carried out in 1905.

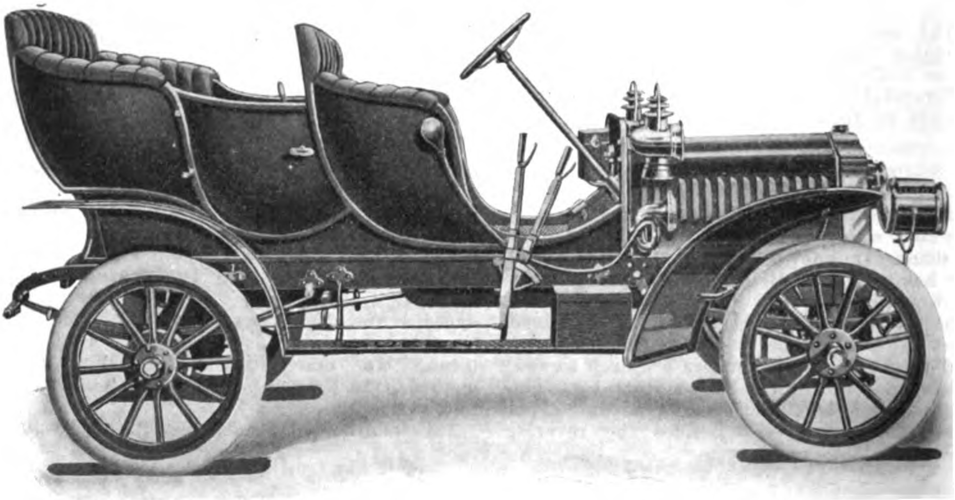


Fig. 1. Model K, Queen 1906 4-cylinder touring car, wheel base, 100 in.; gauge, 56 in.; wheels, 32x4 in.; motor, 4 cylinders, vertical 4-cycle water-cooled, 4¼x4¾, side entrance tonneau body, with seats for five passengers; weight, 2000 lbs.; price, $2000, including mats, horn, tools, three oil lamps and two acetylene lamps with generators, all complete for extended touring.

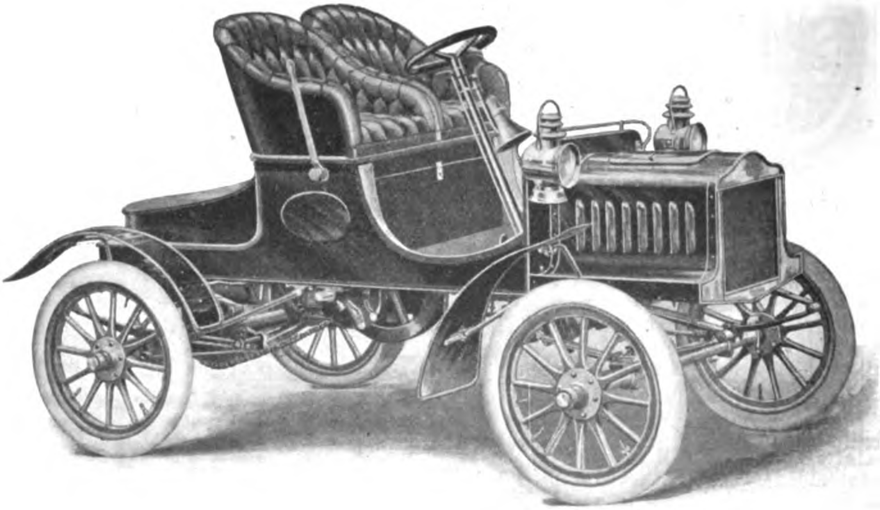


Fig. 2. Model F, Queen 1906 runabout. Wheel base, 76 in.; gauge, 56 in.; wheels, 28x3 in. Motor, a pair of opposed cylinders 4½x4½. Weight, 1300 lbs. Price, $800, including mats, horn, tools and two oil lamps.

The C. H. Blomstrom Motor Company occupy an eight-acre plot crossed by the P. M. and Wabash Railways, and reaching to the river front, located about two miles west of Cadillac Square in the city of Detroit. The main factory building, brick, two and three stories high, fronts 550 feet on Clark street, and a testing room in a separate brick building just completed is 50x150 feet, and in another brick building 40x400 feet, finished cars are stored, and shipping room, and a brick smithy 60 feet square, have also been built this year.

The capacity of the machine shop has been brought up to three times that of 1904 by the installation of milling, drilling and screw machines, all of the highest class, and in addition to all this building and plant increase, this company has extended its line of product by adding a new four-cylinder touring car and a new two-cylinder runabout, so that agents are now offered a full line of 1906 Queen cars all made by this company, comprising the Queen Model K, a four-cylinder touring car, five-passenger, $2000; Model E, two cylinders, a detachable tonneau for four or five passengers, price $1100, and a Model F, a two-cylinder runabout, price $800.

Besides making these large factory and production expansions, this company has found time in 1905 to carefully study the question of the most suitable grey iron for small motor cylinders, with the result of adopting a foreign product costing in London about four times as much as the best American foundry pig. The use of this high priced metal, which is very fine grained and hard and low in sulphur and phosphorus, was begun in November, 1905, and nothing else is now used in Queen motor cylinders. It has now come to be fully understood that perfection of the cylinder both in material and finishing is one indispensable requisite of the best gas engine, and the Blomstrom Company will spare no expense in producing cylinders of the best material, finished in the closest practicable approach to accuracy. The bore of the Queen cylinders is first accurately machined slightly under size, then the cylinder is allowed to stand for two weeks at least, so as to assume a stable form, before grinding in special cylinder-bore grinding machines, which bring the bore very close to absolute truth.

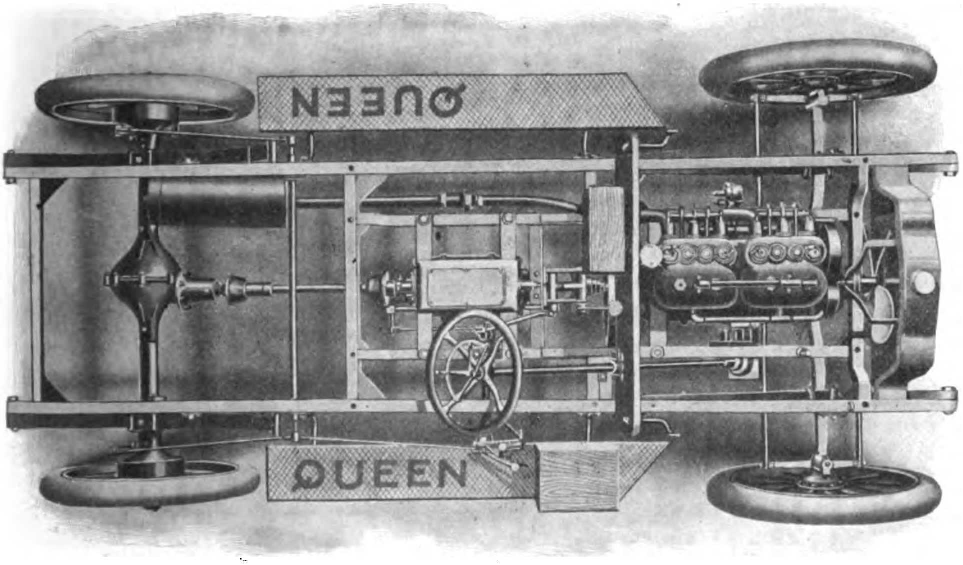


Fig. 3. Blomstrom Queen 1906 Model K, 4-cylinder chassis plan.

The quality of the grey iron used in the piston rings and in the body of the piston is also of great importance, and the same high cost foreign iron is used for these parts in the Queen motors, making all the motor principal wearing surfaces of this special quality foreign iron.

The specifications of the new Queen models are as follows: Model K, Queen 1906, four-cylinder touring car, wheel base 100 in., gauge 56 in., wheels 32x4 in., motor four cylinders, vertical four-cycle water-cooled 4¼x 4¾, side entrance tonneau body, with seats for five passengers, weight 2000 lbs., price $2000, including mats, horn, tools, three oil lamps and two acetylene lamps with generators, all complete for extended touring.

Model E Queen 1906 touring car, wheel base 84 in., gauge 56 in., wheels 30x3½ in. rear and 30x3 in. front. Detachable tonneau, seating four or five passengers. Motor, a pair of opposed 5x5 cylinders; weight 1500 pounds; price $1100, including mats, tools, horn and two oil lamps.

Model F Queen 1906 runabout; wheel base 76 in., gauge 56 in., wheels 28x3 in.; motor, a pair of opposed cylinders, 4½x4½ in.; weight 1300 pounds; price $800, including mats, horn, tools and two oil lamps.

NOTABLE FEATURES.

Besides the specially selected high cost grey iron used in all the Queen cylinders and pistons, the new four-cylinder Model K shows original designs in the clutch, the sliding gear and the brakes, all of which, except the clutch, are illustrated and described in detail. Both the front and rear axles are original designs and together with the bevel balance gear are home constructions, and are also illustrated and described in full.

This Model K is fitted underneath with a formed up sheet steel shield, extending the whole length of the motor and fly wheel and carried out on the sides to the full width of the chassis frame, so as to wholly protect the working parts from sand, mud and road drift of all kinds.

Model E has been improved by the addition of runboards instead of steps, increase of bearing lengths and the substitution of a two pinion circulating pump for the sliding piston arrangement, and the placing of Parsons white brass instead of babbitt anywhere. Double coils are fitted in place of single coils, and the number of automatically supplied oil leads has been increased and the Model E tonneau is made detachable.

Model F, while retaining the same general appearance as that of the 1905 Model F is materially improved in vital points by the change of cylinder and piston material from American foundry irons to the special foreign grey iron, already mentioned, and by the change in boxes from babbitt to white bronze, a metal of comparatively recent introduction, but giving such superior results in points of friction reduction and durability as to compel its use by makers who desire to serve the purchaser's best interests.

The first axles placed under the Blomstroms 1906 Model K were the best productions of the most experienced and foremost of American makers, supposedly the best procurable. When tried out on the road various faults of these axles were made apparent, with the result that now both the front and rear axles of Model K are Blomstrom designs and constructions.

The front axle was first of the accepted design, a primary heavy steel tube, with spring perches and forks applied, the latter being pinned and brazed in what is regarded as the best manner.

This regulation front axle construction was found to be wholly unfit for a high speed, high power car of Model K weight, and has been replaced by a solid single piece steel forging, as being the strongest and most dependable piece known in machine construction. The one-piece hand-forged steel front axle is as reliable as any machine member can be made; it is the final resort when everything else fails, and in placing these single piece steel forging front axles under the Model K, the Blomstrom Company assures its customers the greatest possible expectation of durability, the lowest up-keep charges and the highest probability of safety to life and limb.

While the front axle is of vital importance as a car supporting and guiding element, the rear axle must take the power of the motor and apply it in the best manner to pushing to car forward, and hence is of even more importance in motor car organization than the front axle, or than any other member of the propulsion system. A section of the Blomstrom Model K rear axle is shown in Fig. 6, and a plan is given in Fig. 3. The gear housing is two steel casting cups, flanged, faced and bolted together oil tight, and having a seat to take the propeller shaft sleeves and hubs, which are bored to take the steel tube axle sleeves in long bearings.

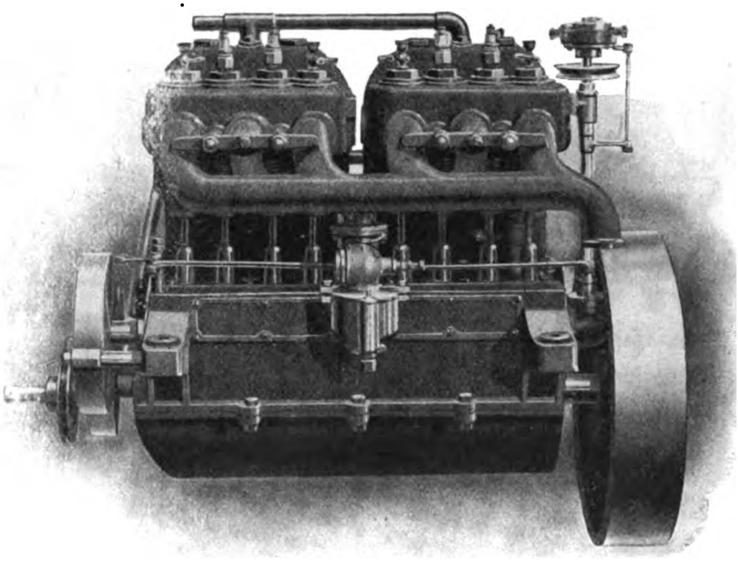


Fig. 4. Blomstrom Queen 1906 Model K, 4-cylinder motor, valve side.

The sleeve ends are turned and forced into the steel cup hubs and pinned and brazed, the brazing serving merely as an endwise retention and an oil tight packing, and being subjected to no working stresses whatever. The steel tube axle sleeves are tapered from the gear housing to the brake flange seat, and these are enlarged to take Hyatt roller bearings, on which the live axles are carried. The brake drums are, of course, fixed to the wheel hubs, and the brake drum covers exclude dust from the brake drum interior.

The elasticity of the Hyatt bearing roller makes it safe against impacts and also in a considerable degree reduces the probability of live axle fracture from shock. The placing of the Hyatt roller bearing in the rear axle is thus seen to be sound practice, well supported by theoretical advantages, besides being fortified by some years of successful use in all classes of motor car rear axle constructions.

The bevel pinion shaft housing is a separate steel casting sleeve, with Hyatt roller bearings at each end, and a ball bearing at the front end of the pinion and two other ball bearings at the gear casing ends. The balance gear is bevel, with a good length of radius, and, it is claimed, harmonizes the wheel travel with far less tire wear than the small diameter spur pinion balance gears.

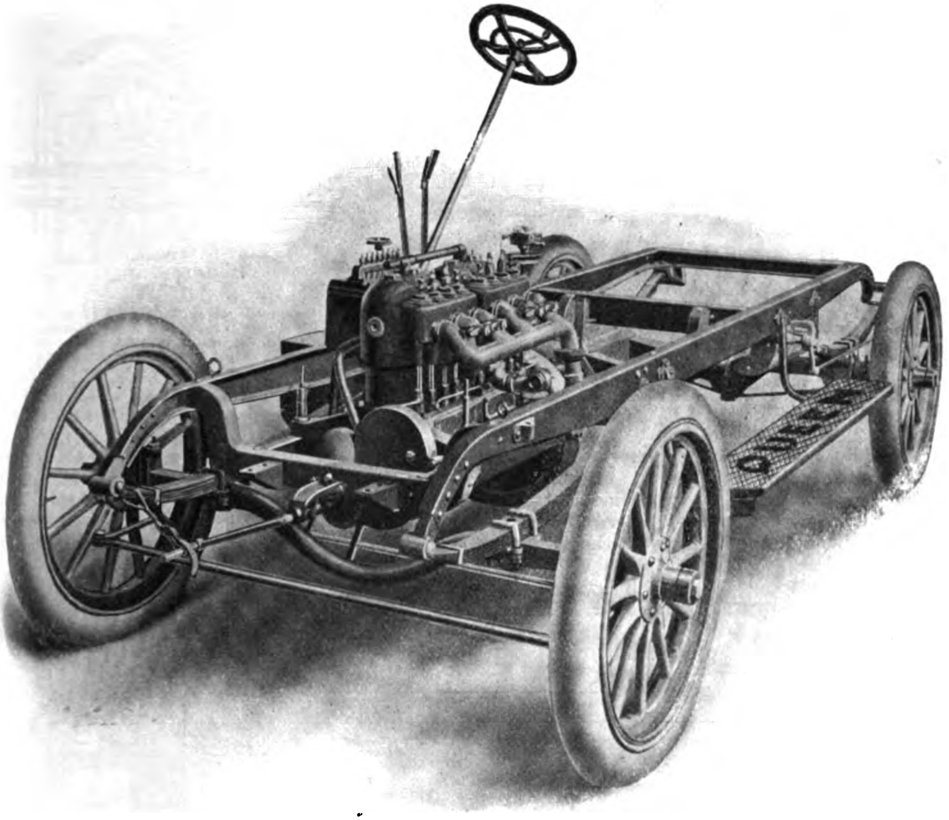


Fig. 5. Blomstrom 1906 Model K, 4-cylinder chassis, front axle. The front axle is a steel forging, all one piece, substituted for the ordinary braced up steel tubular construction, which would not stand under the extended trying out to which this model was subjected. This illustration shows the front chassis construction. The front springs are perched 5 ins. forward of the middle. The steering connecting rod is parallel to the axle.

The steering rod length, from the steering action arm to the sub-axle arm, has been increased by carrying the connection parallel to the axle, by which placing the body rise and fall distortion of the steering linkage is reduced to its lowest terms, and is made to give no trouble at all.

The propeller shaft is fitted with two Spicer universal joints, thus making the action perfectly free, and the change gear, which is of the very simplest form, has unusually large diameters and wide faces, giving much more than the common strength of change gearing.

While there is nothing startling in any of these Blomstrom 1906 Model K changes, they are nevertheless all of them substitutions of original designs, made because the very best of the regular 1905 constructions failed to stand up through an extended and thorough trying out, covering several months of the year, and they are all in line of fewness of pieces of principal members, as compared with the more complicated constructions which they replaced. This Blomstrom Model K chassis is now one of the simplest placed in the 1906 four-cylinder cars, in which probably as many as 20,000 different pieces can be counted in some of the most elaborate examples. The simpler 1906 runabouts have from 7000 to 8000 separate pieces in them, and it would not be very surprising to find designers, say in 1908 or so, showing touring cars with not much more than that number of individual members.

The Model K springs are all half-elliptics, 44 in. long in the rear and 42½ in. long in front, the front springs being perched 5 in. out of centre, short end to front.

The chassis frame is pressed steel, drop forged spring hangers, with a deeply depressed, channel section, front cross member, top at sub frame level, the sub frame being long enough to take the motor and change gear, the rear ends of the sub-frame members being carried up in an OG curve, to join the cross girt.

The weight of Model K is about 2000 lbs., and the motor has four cylinders, 4¼x¾ in., giving ample driving power. The cylinders are cast in dual units, with two exhaust passages and one branched intake passage in each unit, to take a two-branched supply pipe from the carbureter, all as clearly shown in the illustrations.

The cylinders and pistons are very perfectly machined and finished, after a period of rest, by grinding on special grinding machines to practically truly cylindrical form. The Blomstrom Company is equipping its large new factory building with the very best of new repetition tools, and expects to turn out ten per day of the Model K cars after January 1, 1906.

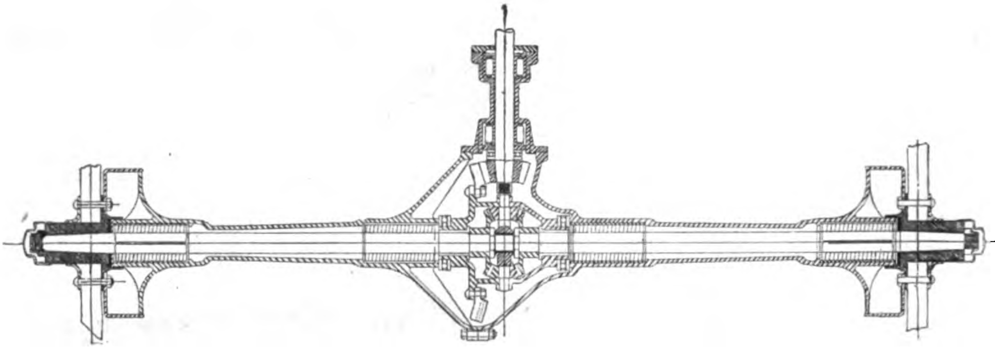


Fig. 6. Blomstrom Model K, rear axle. The gear housing is two cupped steel castings, united at the largest diameter, and having bored hubs which take the finished ends of the steel tube sleeves. The sleeves are pinned and brazed into the casing hubs, and are tapered to the roller bearing seats, to give the correct deflection, equally distributed. The balance gear is bevel, with two ball bearings in the gear box and one forward of the bevel pinion, and the bevel pinion shaft is on Hyatt roller bearings. Brake drum dust covers are secured to the axle sleeves. The rear wheels are applied to taper bearings with long keys, on the live axle ends, and the bevel pinion shaft is carried in a separate steel casting sleeve, applied to the gear casing.

The ignition in Model K is by storage battery, supplemented by six dry cells, in connection with a Splitdorf single unit coil box on the front board, in which any coil can be removed without disturbing any other.

The oil tank is placed under the hood, close to the water jackets, so that it will be somewhat warmed, to ensure uniform action of the oil pumps. The oil feed is positive, with glass sight tubes, brass encased.

The brakes are external and internal, on and in the rear hub drums, separately operated.

Two vertical hand levers, two vertical pedals and two ratchet retained levers on top of the hand wheel gives the control. The outer hand lever, ratchet retained, disengages the clutch and applies the rear hub emergency brakes. The inner hand lever, locked while the clutch is engaged, works the speed change. One pedal applies the ordinary rear hub brake, and the other pedal disengages the clutch and then releases the change gear lever.

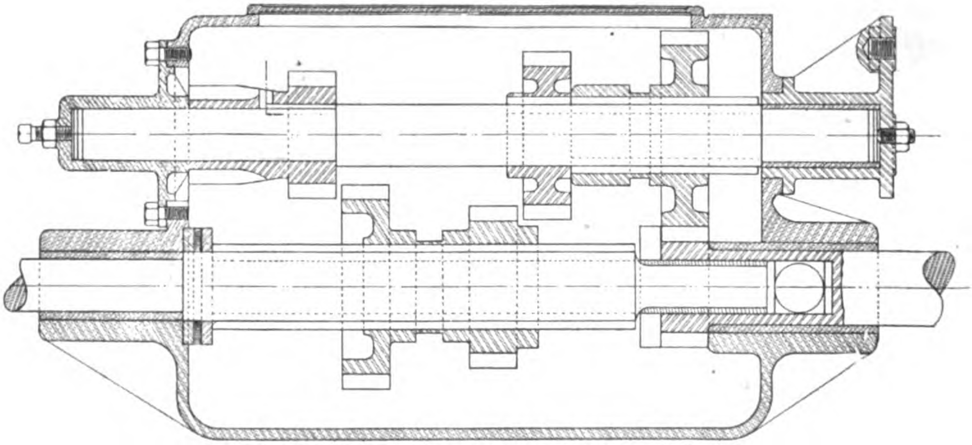
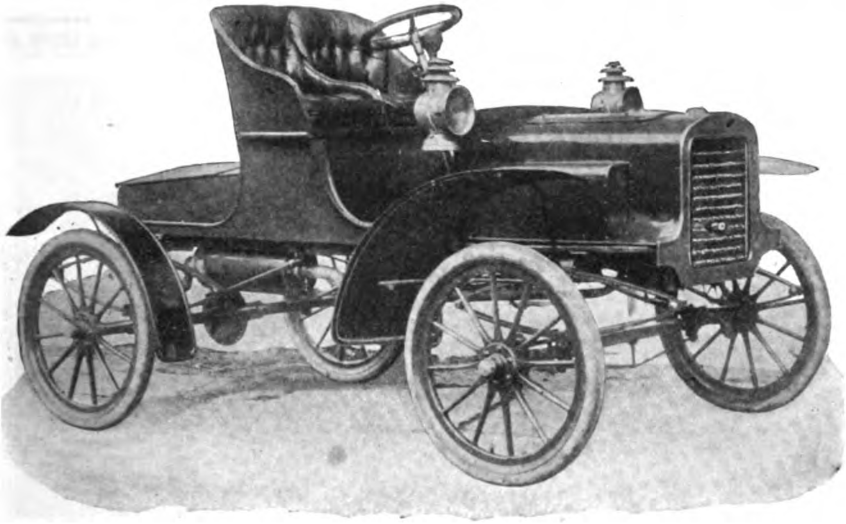


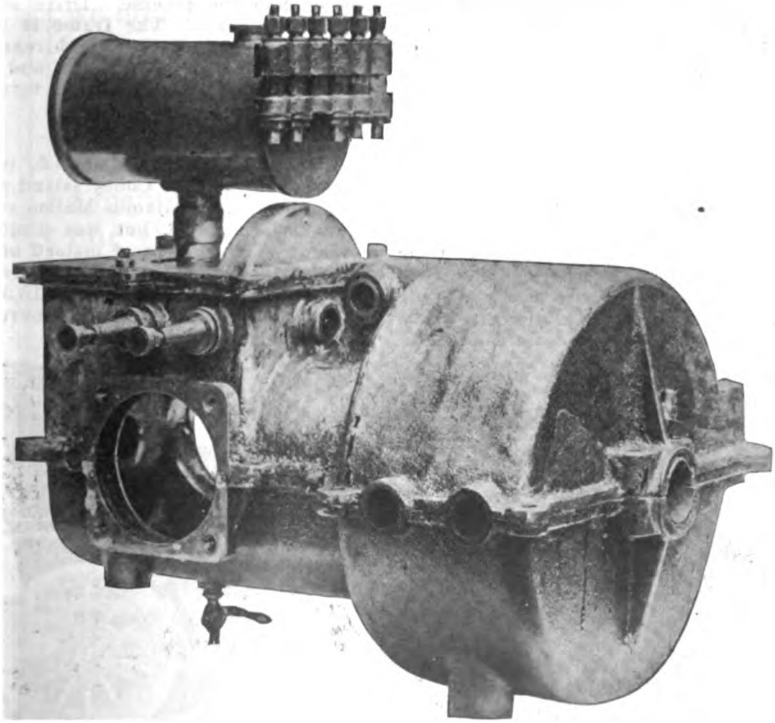
Fig. 7. Blomstrom Queen 1906 Model K, change gear, sectional plan. All plain Parsons bronze bearings. The sliding gear is on a cylindrical shaft with two integral feathers. The gear diameters and faces are unusually large, and the design is simple. All gears are hard, and the entire assemblage is oil pool lubricated. The gear box and cover ar aluminum castings.

Walker Runabout

The Walker Motor Car Co., of 109 Fort St., East Detroit, Mich., have just brought out a new gasoline runabout which is of artistic design and has been built with the idea of practicability in view. This company has had many years' experience in the construction of gasoline motors and have aimed to make their engine one of few parts. This runabout is a quiet, easy running car, which has good speed possibilities. The engine comprises two opposed cylinders each 4x4 inches, which develop 10 H. P. at ordinary speed. It is located under the hood and all parts are accessible.



Walker Runabout, 4 x 4 Gasoline Motor, 10 H. P.

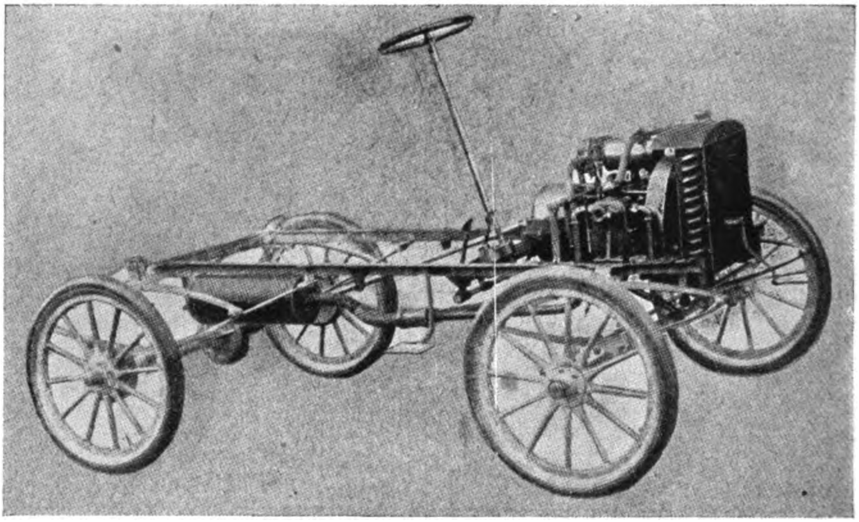


Walker Crank Case, Gear Case and Oiler.—This cut shows the assemblage with cylinders detached. When attached they extend at right angles to this assemblage.

All valves are interchangeable and both sets are mechanically operated. The valve openings are 1½ inches in diameter. A planetary type of transmission is used which gives two forward speeds and the reverse. The crank case and transmission case are combined in one casting, making the whole engine oil proof.

Speeds of 4 to 25 miles per hour are attainable. The drive is by bevel gears and shaft with two universal joints in the shaft. The engine and transmission bearings are automatically oiled through a compression force feed oiler located on top of the crank case and having four sight feeds.

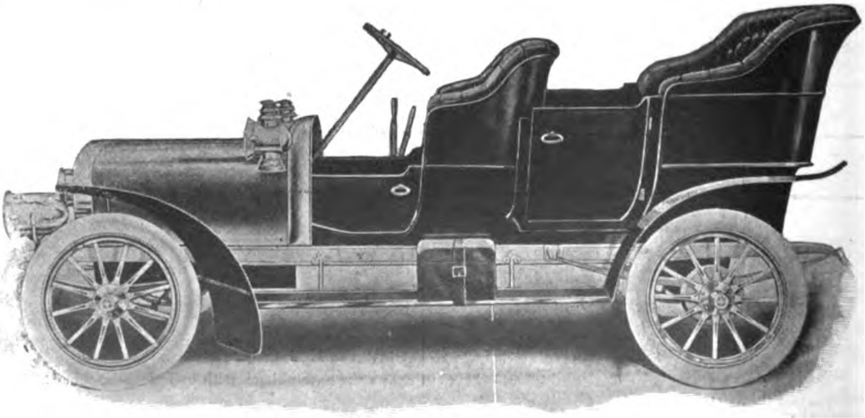
The frame is of angle steel 1¾x1¾x3-16 in. The 28-inch artillery wheels are fitted with 3-inch clincher or detachable tires. The wheel base is 78 inches. Tread is standard. Ignition is by jump spark, coil being fastened on the dash in front of the operator. The fuel tank holds 8 gallons, water system 2½ gallons. Cooling water is circulated by means of a gear pump.



Walker Chassis

The "Aerocar"

The recently formed Aerocar Co., of Detroit, Mich., will commence deliveries of their first car, Model A, in February. This is a side entrance tonneau finished in Royal blue and having seating capacity for five persons. The wheel base is 104 inches; tread 54 in. Thirty-four by four-inch tires are used bot front and rear. The car weighs 2000 pound and lists at $2800. The well-known Reeve air-cooled engine is used. It comprises fou vertical cylinders and develops 24 H. P. Ignition is by jump spark, a storage battery furnishing the igniting current. Transmission i of the sliding gear type, giving three forwar speeds and the reverse. Drive is by shaf and bevel gears. The frame ls of presse steel. Brakes operate on both rear hubs an on the transmission. A worm and nut steering device is used. The car is fitted with a extension top.



"Aerocar" Price $2800.00.

Arthur B. Ennis, in 15.00 4-5, won the 1 mile contest held on Coney Island cycle path November 25. Benjamin Mallon crossed th tape first, in 14.28, but was disqualified o account of using a racer instead of his regular duty machine, as was required. Chas M. Murphy finished third, in 15.31, but h also was disqualified, as he never rode motor cycle on regular duty.

The Successful Ford.

This is why we can build the Ford 4 cylinder Runabout for less than **$500.**

We are making 40,000 cylinders,
10,000 engines,
40,000 wheels,
20,000 axles,
10,000 bodies,
10,000 of every part that goes into the car—think of it! Such quantities were never heard of before. For this car we buy 40,000 spark plugs, 10,000 spark coils, 40,000 tires, **all exactly alike.**

If we made as a profit **one-fifth** as much on each car as is usually figured as a proper profit, we would make as large a gross profit as a manufacturer who **builds two thousand cars.** But who builds two thousand Runabouts?

The first Runabout (Model C) we built cost **$30,000,** yet we sold duplicates of that model for **$750.**

It is the quantity that counts.

Ford Motor Co., Detroit,

Member of American Motor Car Manufacturers' Association, Chicago.

BRANCHES

147-149-151-153 Columbus Ave., Boston 1723 Broadway, New York 727 Main St., Buffalo Broad and Buttonwood Sts., Phila. 1418 Michigan Ave., Chicago Cleveland and Kansas City. Canadian Trade Supplied by Ford Motor Co., of Canada, Ltd., Walkerville, Ontario.

The Successful Ford.

The Ford Four-Cylinder Runabout.

It is a fact that thousands of these cars are in course of construction.

Like all Ford cars, this one is a radical departure from previous and popularly accepted designs, and there is a reason behind every radical idea.

If a car has flexibility and latitude of power it must have ***great power.***

If the cost of maintenance is low, the car must be light.

These facts must be taken into consideration, for they have to be dealt with.

There is no way to build a flexible, high-power engine, at the same time making it light, except by multiple cylinders. That is another fact that is established. Therefore, to bring the Runabout to the proper state of perfection desired by Mr. Ford, it was necessary to have it light—it was necessary to have the motor flexible—it was necessary to have it powerful.

The question simply resolved itself into building a simple engine, and building it in such great quantities that it would be possible to reduce the price of a single engine to conform to his idea of a low-priced Runabout.

Henry Ford built a 4-cylinder engine for this Runabout with fewer parts than the old-fashioned single-cylinder engine had, and the Ford Motor Co. have an enormous factory that does nothing but build motors for this Runabout, with a capacity of **100 complete engines every day.**

The whole thing is very simple when you go about it right.

See this car at the Automobile Club of America's Show at the 69th Regiment Armory, New York, January 13th to 20th.

Ford Motor Co., Detroit,

Member of American Motor Car Manufacturers' Association, Chicago.

BRANCHES

147-149-151-153 Columbus Ave., Boston 1723 Broadway, New York 727 Main St., Buffalo
Broad and Buttonwood Sts., Phila. 1413 Michigan Ave., Chicago Cleveland and Kansas
City. Canadian Trade Supplied by Ford Motor Co., of Canada, Ltd., Walkerville, Ontario.

The Successful Ford.

The Six-Cylinder Ford.

"Always a year or two ahead." When the single-cylinder car was "it," Henry Ford produced a double cylinder opposed motor, more powerful and at a lower price.

When the automobile trade finally awakened to the possibilities of the 2-cylinder opposed motor, Mr. Ford produced a 4-cylinder car at $2,000 that was in a class by itself, the public having been taught to believe that such a car could only be produced at a fabulous price.

And now, having exhausted the possibilities of the 4-cylinder car in a touring car class, he has introduced it into the Runabout class, and in addition offers a 6-cylinder car that is proportionately as far in advance of all competition as his first double opposed motor.

This is a wonderful car.

First, its six cylinders give a power and latitude of speed never before accomplished in a car of its class and weight, 2,000 pounds. From four miles per hour on a high gear up to fifty miles. But it takes 40 H.P. to do it.

While one cylinder of this car will develop sufficient power to drive it along an ordinary asphalt pavement, the whole six cylinders inspire the driver with the confidence that there is an enormous latent energy in his motor, ready for any new demand without overloading the motor, making it the easiest controlled and most flexible automobile motor ever built.

When you have seen this motor in operation you will fully appreciate that we have the smoothest running automobile motor in the world.

Price, $2500.

See this car at the Automobile Club of America's Show at the 69th Regiment Armory, New York, January 13th to 20th.

Ford Motor Co., Detroit,

Member of American Motor Car Manufacturers' Association, Chicago.

BRANCHES

147-149-151-153 Columbus Ave., Boston 1723 Broadway, New York 727 Main St., Buffalo Broad and Buttonwood Sts., Phila. 1413 Michigan Ave., Chicago Cleveland and Kansas City. Canadian Trade Supplied by Ford Motor Co., of Canada, Ltd., Walkerville, Ontario.

The Successful Ford.

The Ford Idea of Price.

Early in the history of the automobile industry Henry Ford took the position that there should be no restriction in the price of the automobile. The automobile was a great institution, of stupendous possibilities, and so necessary that nothing should hinder its development, restrict its output, or hold up a fictitious value.

So he refused to become a member of the automobile Trust. On the contrary, single-handed and alone his Company fought the so-called Selden patents for years, and the Ford Company has elected to make its own price on its product.

Henry Ford's idea is to build a high-grade, practical automobile, one that will do any reasonable service, that can be maintained at a reasonable expense, and at as near $450 as it is possible to make it, thus raising the automobile out of the list of luxuries, and bringing it to the point where the average American citizen may own and enjoy his automobile.

So in making the price on the 4-cylinder Runabout, the question was not "How much can we get for this car?" but "How low can we sell it and make a small margin on each one?"—"How many cars must be turned out to get the lowest cost per car, and will the demand absorb this tremendous output?"

These have been mighty questions.

To build the number necessary to sell a car of this class for less than $500 was a proposition that staggered every man in the automobile industry.

But the Ford Company are doing it, and as a result thousands of people will own a good car this year where otherwise it would have been impossible.

Ford Motor Co., Detroit,

Member of American Motor Car Manufacturers' Association, Chicago.

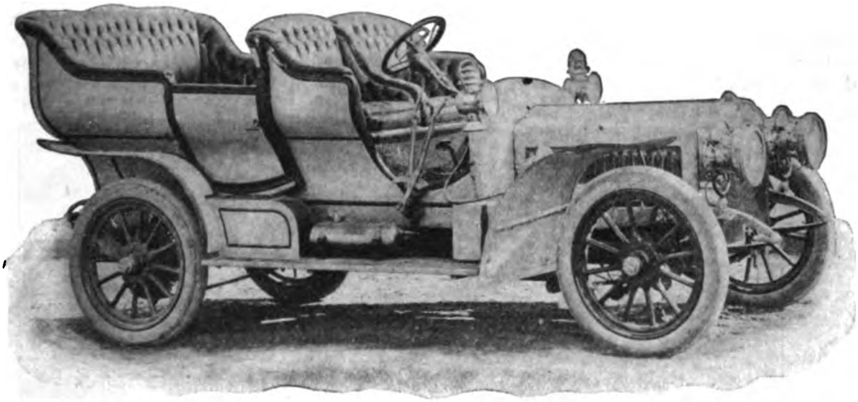
BRANCHES

147-149-151-153 Columbus Ave., Boston 1723 Broadway, New York 727 Main St., Buffalo Broad and Buttonwood Sts., Phila. 1418 Michigan Ave., Chicago Cleveland and Kansas City. Canadian Trade Supplied by Ford Motor Co., of Canada, Ltd., Walkerville, Ontario.

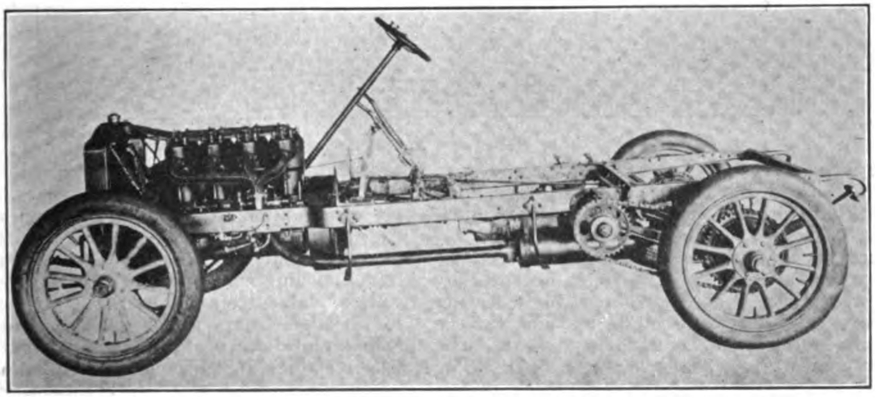
The 1906 Thomas Flyer

BY W. J. GRUBE

The E. R. Thomas Motor Co., Buffalo, N. Y., will market but one model chassis for 1906. This has a fifty H. P., four-cylinder, vertical motor; a four-speed sliding-gear transmission. Drive is by shaft to transmission, and counter-shaft, through final double chain drive to the rear axle. The car has a wheel base of 118 in.; tread, 56½ in. Wheels are 34 in. diameter, shod with 4½ tires. The general arrangement of mechanism and design follows the lines of the 1905 model, but the car has several important changes, adding to the comfort and to the general efficiency. These changes are herein described for the first time.



The 1906 7-passenger, 50 H. P., 4-cylinder Thomas flyer, four speed and reverse sliding gear, wheel base 118 in., 34x4½ in. tires, weight 3200 lbs., price $3500.00.



Side view of chassis 1906 Thomas flyer.

NOTABLE CHANGES.

The most notable changes are that the motor has been increased in size and fitted with mechanical intake valves and mounted on the main frame instead of a sub-frame as heretofore. This arrangement allows the car to be turned in a smaller radius, as the frame being narrower in front allows the steering wheel to be set at a more acute angle. Another important change is the substitution of a metal disc clutch for the cone clutch (this clutch is described in detail later), and that the transmission has four speeds forward instead of three. The wheel base has also been increased, and steering rods are now placed back of the front axle. Magneto-ignition is also supplied, but at an additional cost.

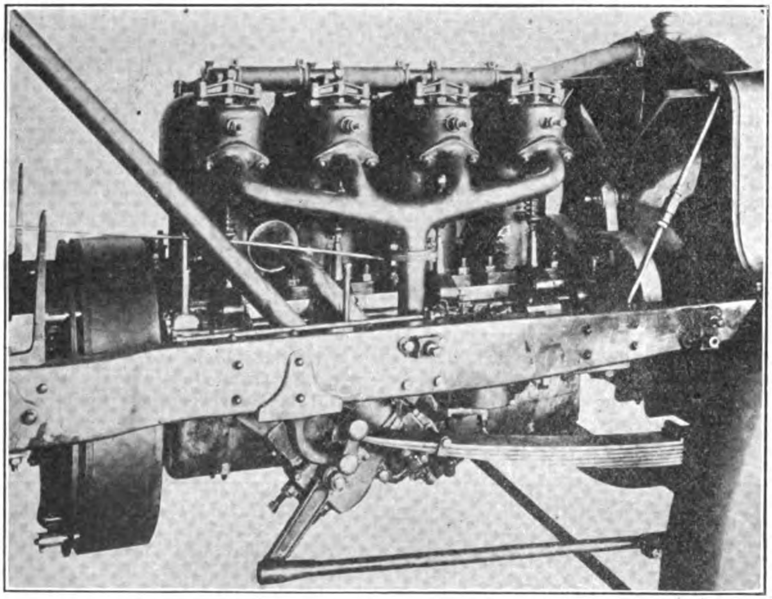
FRAME.

Is of pressed steel construction, .20 to .30 point carbon, 4⅝ in. deep in centre, and tapered at both ends to take the spring hangers, which are drop forged and riveted to the frame. Frame is narrower in front, and is reinforced at the curves by pressed steel section, of same construction and thickness as side members, which strengthens frame materially at these points, which are naturally the weakest. Cross-bars are of the same section as the side members to which they connect, and to which they are riveted and are braced by large angle plates. In addition, the side members are trussed from about eight inches in front of the front spring hangers to the rear spring supports with ⅝-in. round steel rods, connected with right and left turnbuckle.

Semi-elliptic springs of extra length are used, the front springs being 43 in. long, 2¼ in. wide, 7 leaves; the rear springs, 48 in. long, 7 leaves, 2¼ in. wide. The front springs are shackled at rear end; the rear springs shackled both front and rear. The front end being encased in bronze housing, which carries the bearings for jack shaft. This housing is cast with support to which the chain guard and the step to tonneau are fastened.

BODY.

The body design is very similar to last year's design, which proved so popular, and the special dust deflecting shape is adhered to, but tonneau backs are not quite as high as formerly and do not obstruct the view in case passengers wish to look backward. The tonneau is especially wide and luxurious and rear seat accommodates three people very comfortably. In addition to the rear seat tonneau is fitted with two revolving seats which will accommodate two more. The occupants of these seats can face forward or sideways or towards the rear, as they see fit. In case the space occupied by the revolving seat is wanted for carrying space, the seats are collapsible and can be easily stored under rear tonneau seat. The car comfortably seats seven people. The cars are finished regularly in three colors, French gray, permanent blue and royal green, striping and trimming being in harmony with the color.



Inlet side of 1906 Thomas flyer engine.

In addition to the large touring box which has always been carried in the rear, the 1906 model is fitted with trunk rack 20x30 in., which, when not in use slides entirely under the body and out of sight. The car weighs completely equipped with two headlights and generator, two side lamps, tail lamp and horn, 3200 lbs. The price is $3500. Top and storm aprons extra, $150. Plate glass front extra, $50. Although the Thomas Co. are making but the one model chassis, they finish this model in four different styles of body—the regular touring car, a limousine, a landaulet and a semi-landaulet. The later models were not sufficiently far advanced to get details, but will be on exhibition at the New York show.

THE MOTOR.

This has four vertical cylinders. Water-cooled cylinders are cast separate, of hard, gray iron, and have a bore of 5½ in. and stroke of 5½ in. The valve chambers, water jacket, and cylinder heads are cast integral with the cylinder. Valves are all mechanically operated, and are 2 in. diameter and are interchangeable. The caps over the valves are easily removed by loosening one set-screw, which allows yoke over cap to be turned around or removed. The valves are operated by two separate cam shafts, driven by combination steel and fibre gears from the engine shaft. These cam shafts are arranged outside of the engine case, but have openings at cams which allow cams, rollers, valve-lifters, and cam-shaft bearings to be oiled from engine splash. The valve stem guides are of bronze, and carry valve-lifters, which in turn carry ⅞ in. diameter, ⅝ in. face, hardened steel rollers. When these valve guides are in place, they effectually close openings in crank case. The cams are of large diameter, and have no straight sides, and valve operation is almost noiseless.

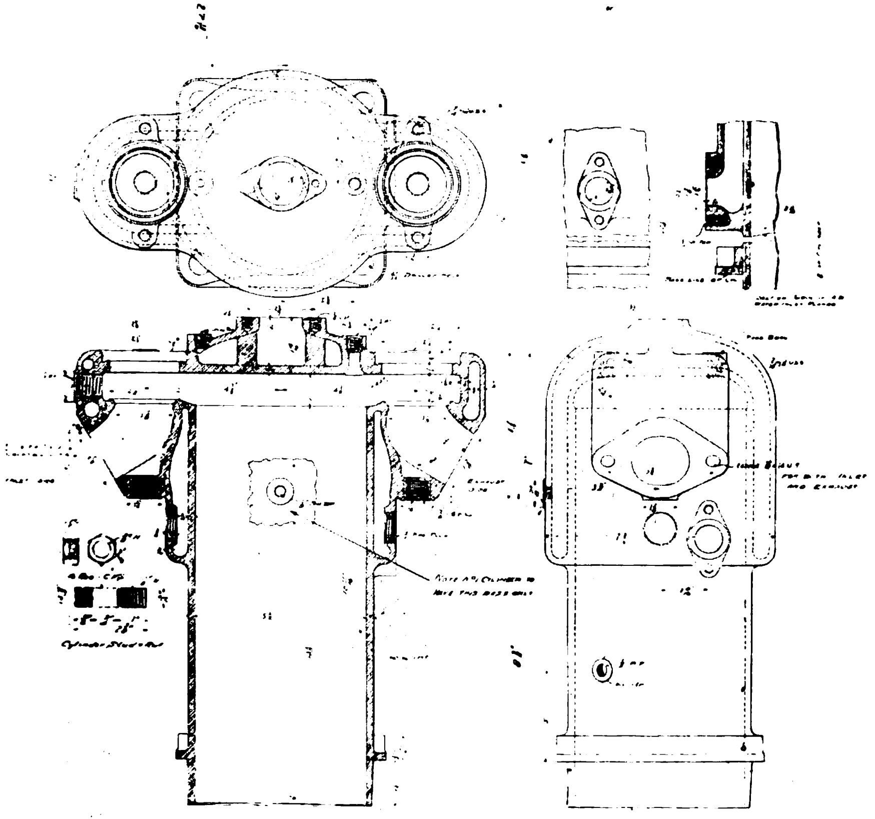
The crank shaft is a solid forging, 1⅞ in. diameter, all bearings being ground accurately to gauge. The crank is carried in five bearings. The outside bearings being 4 in. long and fitted with chain oilers. The inside bearings are 2½ in. long, and cast with oil pocket in caps which fills with oil from the splash. All the crank bearings are secured to the upper half of the crank casing.

and the lower half acts only as a dust cover and an oil well. The lower half is also cast with partitions, to assure each individual crank being properly oiled.

The pistons are 7 in. long, and carry four packing rings above the pin and one below. The rings are tongue-lapped. The piston pins are hollow and hardened. The connecting rods are drop forged, and fitted with bronze bushing at piston pin end. The crank pin bearings are adjustable, and are lined with special babbit.

IGNITION.

The ignition is by jump spark, one coil and distributor being used. The commutator and distributor are both arranged on dash and can be easily removed by taking out three screws, without disturbing any of the wiring. The current is supplied by Witherbee storage battery or by Holley magneto. The commutator is driven by shaft and bevel gears from half time shaft. It has four hardened steel joints and contact is made by wipe, and not by roller. It is very substantially made and said to give very little trouble.



Cross sections of Thomas flyer motor cylinders, showing arrangement of valves, spark plugs, exhaust and inlet passages, water jackets, water inlets and studs for securing valve caps in place.

LUBRICATION.

The oiling is accomplished with positively driven oiler located on the dash, driven with shaft and bevel gears from the other half time shaft. It feeds oil directly to the engine cylinders and to the engine crank case. The oiler contains no valves and is very efficient and economical in operation.

CARBURETOR.

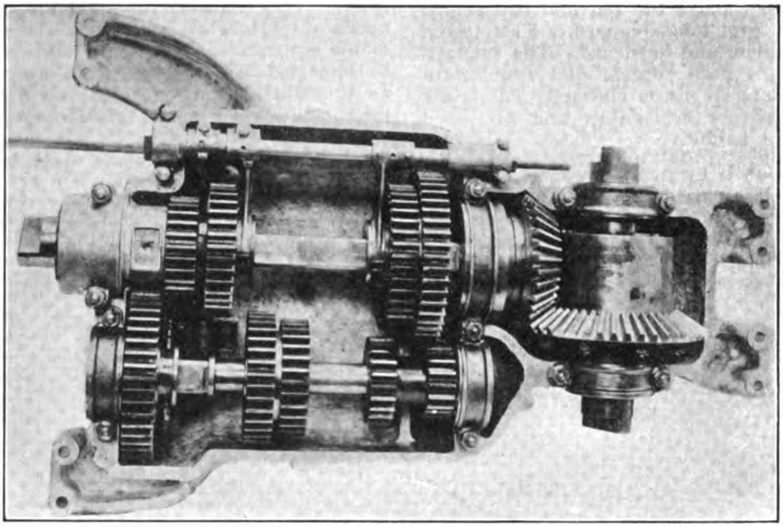
The carburetor is of the float feed spray type, but has several original features. The gas throttle is linked by peculiar mechanical arrangements to air throttle which varies the position of air throttle in exact proportion to needs of the engine, between carburetor and motor is arranged a butterfly throttle, which is connected to clutch operating lever so that as the clutch is disengaged, the throttle is practically closed, which prevents motor from racing just as effectually as with a governor and with more certainty and much less complication.

COOLING SYSTEM.

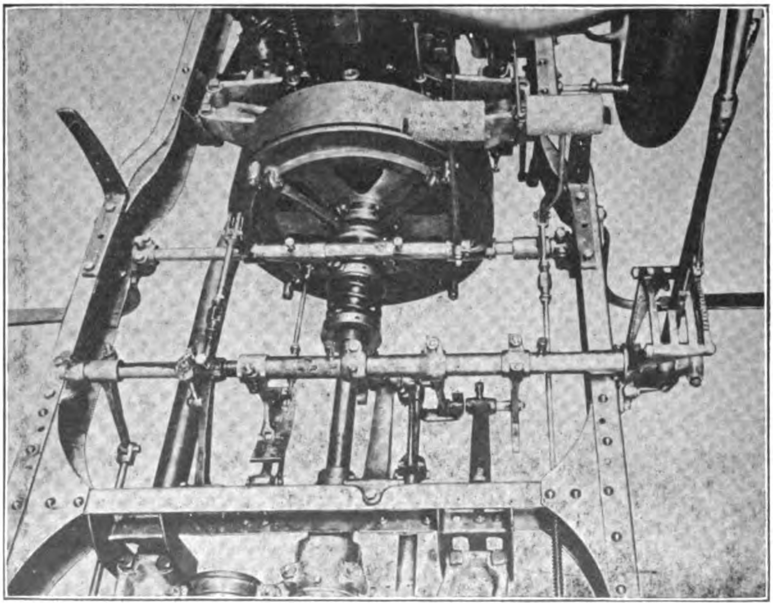
The cooling system consists of a Whitlock radiator mounted in front, a positively geared circulating pump, driven from half-time shaft and a belt driven fan. The fan is supported from engine base and front cylinder, and is driven by endless belt. The bearing support is eccentric for tightening the fan belt. The water circulates from radiator through strainer to pump, from pump it enters cylinder water jacket immediately under exhaust chamber and at the hottest part, from top of the cylinders back to the radiator.

TRANSMISSION.

The transmission gives four forward speeds and one reverse, and is of the direct drive on high-gear type. The counter-shaft not running when on high gear. The transmission runs on five Hess-Bright ball bearing and one Hyatt roller bearing. The roller bearing, which is particularly adapted to withstand hard service, being placed on the drive end. The gears are hardened and ground accurately to size, and are of the ring type, bolted to hub flanges, and are readily removable. The Hess-Bright bearings are held in place by straps cast of Parson-Cramp bronze, and which are secured in place by studs and castle nuts. The bearings are held securely independent of the case, and the car can be run with the top half of the transmission case removed.



Thomas flyer, 4-speed transmission, containing five Hess-Bright bearings and one roller bearing; the counter shaft is inoperative on the high or direct drive.

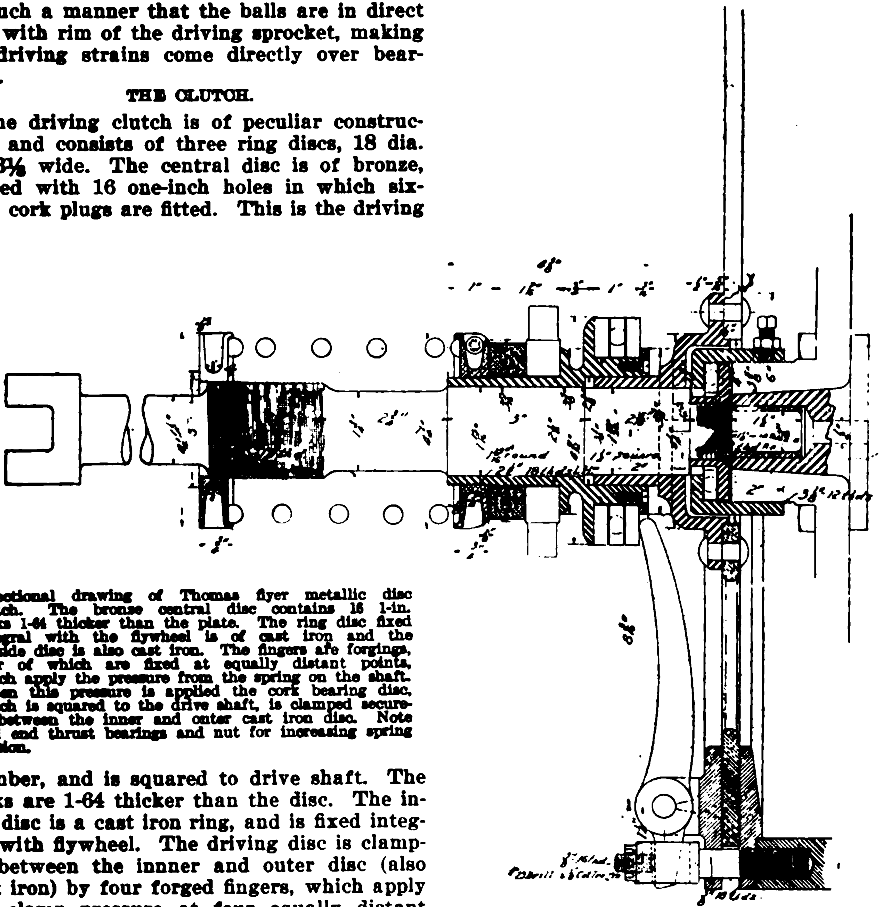


Section of Thomas frame, showing new metallic disc clutch, the re-enforcing of frame at the curves, the especially long gusset plates, the interlocking device and the bronze hangers that attach the forward end of transmission to the cross frame member, and the quandrant and gear and brake-operating levers.

The transmission case is of aluminum of high tensile strength, divided horizontally in the centre. The differential is fully encased in the transmission case, which also carries the two Hess-Bright ball bearings that support the inner ends of the jack shaft. The differential is of the all spur type, the pinions of which can be reversed when worn, allowing as much additional wearing service as when new. All the transmission gears are of 6 pitch 1½ face. The bevels are of 5 pitch, accurately planed, in the usual manner, and ground to size after being hardened, assuring the truth of teeth and wearing surfaces. The transmission also carries two ball-end thrust bearings, carrying 31 ⅝ balls, which takes care of the end thrusts set up by the bevel gears. The shifter arms are drop forged and are clamped and dowelled to rod. The sliding train is mounted on squared and hardened shaft of high carbon steel. The transmission counter shaft is of tool steel. The car drive shaft is of high carbon steel and runs on four Hess-Bright ball bearings, the two already mentioned as being mounted in transmission case. The other two are carried in bronze housings, which are attached to main frame at spring supports. The bearings are arranged in such a manner that the balls are in direct line with rim of the driving sprocket, making all driving strains come directly over bearings.

THE CLUTCH.

The driving clutch is of peculiar construction and consists of three ring discs, 18 dia. by 3⅛ wide. The central disc is of bronze, drilled with 16 one-inch holes in which sixteen cork plugs are fitted. This is the driving member, and is squared to drive shaft. The corks are 1-64 thicker than the disc. The inner disc is a cast iron ring, and is fixed integral with flywheel. The driving disc is clamped between the innner and outer disc (also cast iron) by four forged fingers, which apply the clamp pressure at four equally distant points on the periphery of ring. The spring on shaft applies a pressure of about 300 lbs. but the leverage is so great, about 11 to 1, that the clutch is very easily engaged and disengaged. The clutch is fitted with ball bearings to take end thrust and so arranged that no end thrust whatever is thrown on motor. The Thomas Company informed the writer that it was the most efficient clutch they had ever used, and in addition to smooth starting, it was absolutely sure to hold when full pressure was applied. In addition to these points the driving disc, being so very light, is sure to prevent shocks to the gears, and the ease with which the corks can be renewed in case they are worn is worth considering, as it would only be necessary to punch the old ones out and to insert new ones. A full universal joint is used between the clutch and transmission, which takes the place of a semi-universal that was used on the 1905 model.



Sectional drawing of Thomas flyer metallic disc clutch. The bronze central disc contains 16 1-in. corks 1-64 thicker than the plate. The ring disc fixed integral with the flywheel is of cast iron and the outside disc is also cast iron. The fingers are forgings, four of which are fixed at equally distant points, which apply the pressure from the spring on the shaft. When this pressure is applied the cork bearing disc, which is squared to the drive shaft, is clamped securely between the inner and outer cast iron disc. Note ball end thrust bearings and nut for increasing spring tension.

AXLES.

The axles are both drop forged of I-beam scetion, the front axle having the steering yokes and spring seats forged integral. The rear axle is slightly dropped and has the spring seats forged integral with the bed. Both the front and rear wheels carry a pair of Hess-Bright ball bearings. Bearings in the rear wheel are arranged in such a manner that one set comes exactly under the chain line, allowing the driving strains to come directly over the bearing.

CONTROL.

The spark and throttle levers which are arranged on top of steering wheel, are of the button and sector type, fixed independently of the steering wheel. The rods which operate the spark and throttle through bevel gears pass through the steering post. The gear shifts are all on one lever with double path in quadrant. The extreme forward movement of lever in outside path gives the reverse a backward movement in same path it gives the first and second speeds. The inside path gives third speed by forward motion, backward motion the high and direct speed. Interlocking device absolutely prevents gear shifts unless the clutch is disengaged. Left hand foot pedal operates clutch. The right hand pedal operates the internal expanding brakes in rear wheel. The outside clamping or emergency brakes are set with the outside lever at the side of the seat. The application of ratchet brake was previoiusly explained.

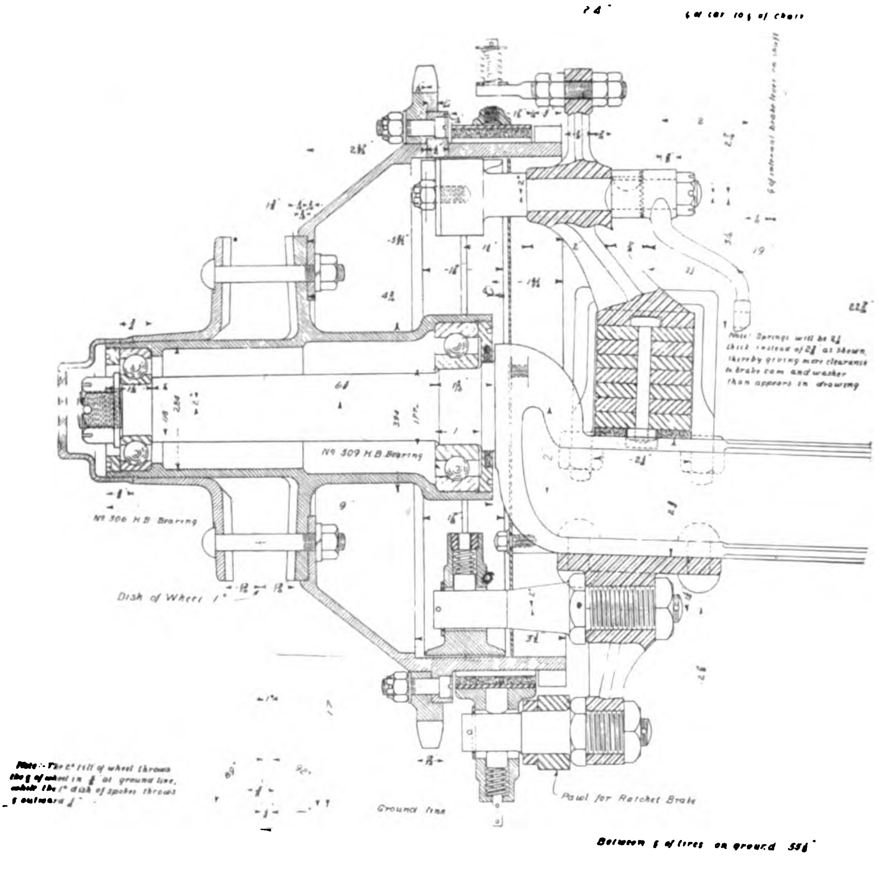
BRAKES.

The Thomas car is equipped with three sets of brakes. It has two internal expanding brakes 11⅝ dia., 1⅞ wide, that are applied with foot pedal. Two outside clamping brakes 12¼ in. diameter x 2 in. wide. These are applied with side lever. In addition to these the cars are equipped with ratchet brake, the ratchet being cast integral with rear wheel brake drum, and is on the outside instead of on the inside as formerly. The steel pawl that when thrown in prevents car from running backward, is applied by small bronze lever, cast with an eye, which is arranged at right of driver on front seat. This is connected to brake pawl by cable, and when lever is thrown straight up pawl is in engagement, and when down, disengaged. This ratchet brake is an exclusive Thomas feature and is protected by patent. It absolutely prevents accident in case motor stops on a steep hill.

The steering gear is of the worm and sector type, worm and sector both being hardened. It is securely fastened to the frame. The steering rods are fitted with Billings & Spencer ball joints. The rod being arranged back of the front axle instead of forward as in former models.

LITTLE THINGS.

The Thomas Co. has given small details of construction the utmost consideration, castle nuts split keys being used generously throughout and every precaution is taken to secure against any screw or bolt from working loose. In addition all ignition wires are run through copper tubing to prevent them from becoming soaked with oil. A few other little conveniences were noticed by the writer, one of which was a lug cast on each cylinder directly back of exhaust valve spring which makes a very easy job of removing the valve spring, as the company furnishes a special tool for resting on this lug whereby the spring tension can be easily removed. A leather plunger is also fitted to rear internal brake, which prevents dirt or oil from working in. Driving sprockets can


Nº 509 H.B. Bearing
Nº 306 H.B. Bearing
Dish of Wheel 1"
Ground line
Pawl for Ratchet Brake
Note: Springs will be 2¼ thick instead of 2⅜ as shown, thereby giving more clearance to brake cam and washer than appears in drawing
Note:- The 2° tilt of wheel throws the ℄ of wheel in ⅜ at ground line, while the 1" dish of spokes throws ℄ outward ¼"
Between ℄ of tires on ground 55⅞"
22⅞
19
64
42
9

Cross section drawing, Thomas flyer, rear hub and axle, showing arrangement of Hess-Bright bearings. Note driving sprocket is carried between bearings, the arrangement of brakes and operating levers, the spring seats, the drop in axle and dish of wheels, also the securing of the sprocket to the wheel.

be readily changed by removing six screws, and gear changed very easily upon the road.

The Thomas Co. are using no brass plating anywhere, all levers, steering wheel, spider, and every place brass plating was formerly used, this year being solid manganese bronze. This assures against the finish of these parts becoming rusted after a couple of months' use.

ON THE ROAD.

The writer was invited for a ride in the demonstration car and for part of the run the car was loaded with twelve passengers. This came about quite by accident, as when the writer, together with Advertising Manager Davis, Assistant Sales Manager Hatch and the chaffeur got ready to start, the car was found to be already occupied by the feminine members of the Thomas clerical force. Mr. Davis explained that he had no part in this arrangement, but it served so well to demonstrate the power and carrying capacity of the Thomas that it looked to the writer as if it might have been prearranged. The car was driven for quite a distance and over several long grades, although no steep hills were encountered. The engine picked up this load very quickly on the high gear and ran very smoothly at all times. The clutch started the car very smoothly and without shock, and when clutch was disengaged the auxiliary throttle would slow the motor in a very satisfactory manner. The car rides very comfortably with seven passengers and control seemed to be perfect at all times.

America Makes the Finest Cylinder Castings

By F C. FROMM

In contradiction of the repeated assertions made by importers of foreign machines that "no first-class cylinder castings could be secured in America," it affords us great pleasure to give our readers the following account of the work accomplished by the Manufacturers Foundry Co., Waterbury, Conn., in the production of the highest grade cylinder castings.

This concern is one of several which have made gas engine cylinder castings a special study, and we feel safe in predicting that within a very short time the importation of foreign castings will be altogether discontinued.

"The motor is the heart of the automobile" is a hackneyed expression which does not cease to be the truth because of its frequent repetition. And it must also be admitted that the cylinders are certainly the most important of the component parts of the motor, and it is safe to say that to secure satisfactory cylinder castings has been one of the greatest difficulties encountered by the automobile manufacturer. It seems to have been universally determined that grey iron is the most satisfactory metal for cylinders when all conditions and requirements are taken into consideration. The automobile engineer has been seriously handicapped in his efforts to carry out his ideas of cylinder design by the inability of the average American foundryman to produce castings of the shape and dimensions desired. When the foundryman did succeed in casting an apparently satisfactory cylinder there was still the danger that the mixture of iron used was not of the required strength. All this led to the criticism that no American foundryman could possibly equal the foreigners in making these intricate waterjacketed cylinders. The foreign foundryman has certainly had all the best of the opportunity to develop and perfect his product. He has had 15 or 20 years of experiment and experience behind him.

Just as the American automobile manufacturer in these last few years has overtaken the foreign automobile manufacturers so also has at least one foundry in this country developed the production of waterjacketed cylinder castings to a standard of quality unexcelled by that of the foreign foundries. Realizing that in attempting to excel the foreign castings they must give their entire attention to this one line of work, The Manufacturers Foundry Company, of Waterbury, Conn., made a careful study of the methods of the French foundries. They also carefully examined into the mixtures of irons used by the Frenchman and has successfully evolved a mixture which enables them to make their cylinders as light as the foreign castings and at the same time of equal strength. In order to bring this one line of foundry work to this degree of perfection it was necessary that the foundry should give their entire attention to cylinder castings, and they made this one line their specialty.

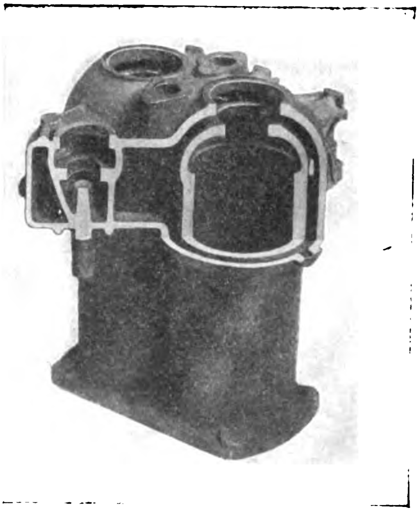


Fig. 1. A sample of the intricate castings produced by the Manufacturers' Foundry Co.

It used to be, yes, and is now, in many places that the foundryman was a man who melted iron and scrap in a cupola and poured Foundry Company recognized the future possibilities of the automobile industry and equipped a foundry for good, fine and accurate work. They built in such a way that the

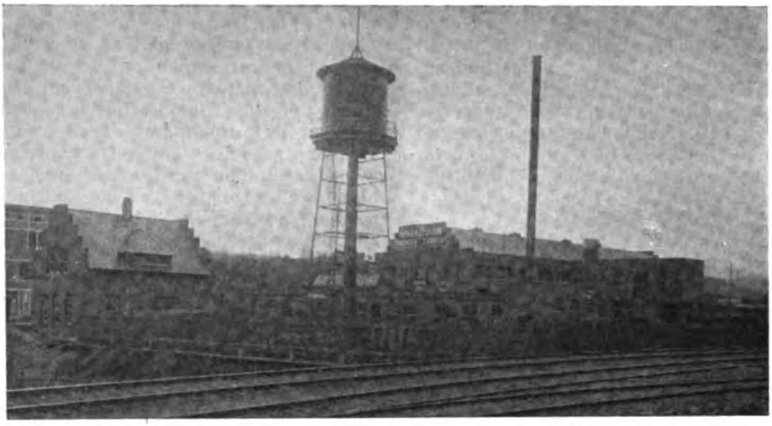


Fig. 2. The Plant of the Manufacturers' Foundry Co. at Waterbury, Conn.

most exacting demands of the engineer could be met.

The reader will naturally wonder why a foundry company should have to build or especially plan in order to do good work. It must be understood that the foundry business is a very dirty business as ordinarily conducted. Consequently most foundries are tucked off in any old dark hole where it will be no more of a nuisance than is absolutely necessary. Foundry buildings are dirty and ill-kept, and what is most important, badly lighted. Even on bright days the moulders may be seen working with hand torches to help out the artificial light that is trying to find its way through the dirty electric light globes. Close work in such a foundry is out of the question. Close work is the essential of automobile castings.

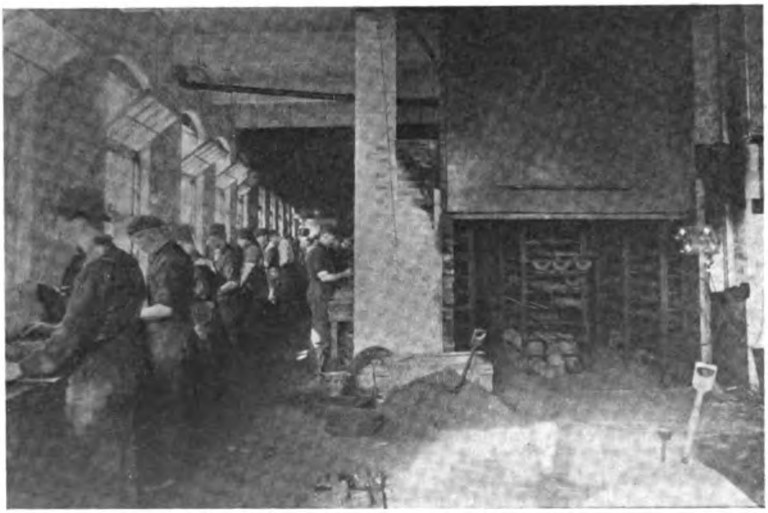


Fig. 3. Manufacturers' Foundry Co., one of the core ovens.

The setting of cores in the moulds is a matter of great care. With walls of iron to be made an eighth of an inch thick, an error of a hundredth is all that can be tolerated. An eccentric core means a spoiled it into moulds. Any kind of work, all sizes and shapes. A mixture of patterns and moulds without end as to variety.

The work done was of the rough and ready sort. Nice work was avoided as far as possible as it cut down the volume of production and necessitated high priced help.

A few years ago the automobile makers began to demand waterjacketed cylinders for their engines. It was difficult to find a foundry that would undertake the work. It was difficult because of the elaborate core work necessary to make a casting with water jacket integral with it. The demand of the automobile engineer that every ounce of weight be saved made thin work necessary. Thin cored work necessitated accuracy such as the foundryman had never resorted to before. Consequently, it was very hard for the automobile maker to get proper castings made.

The management of The Manufacturers

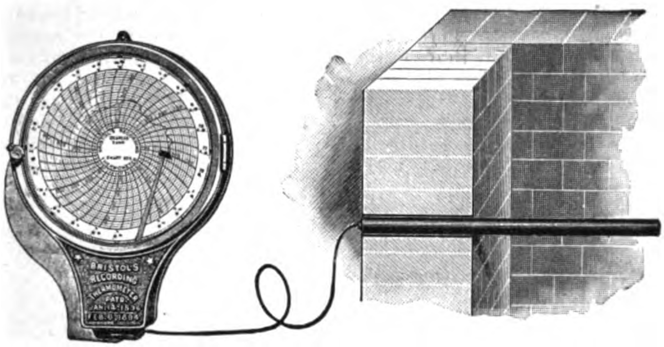


Fig. 4. Manufacturers' Foundry Co., pyrometer for recording temperature of ovens.

casting for an automobile engine. Such a one may pass inspection and get into use, but the thin walls soon yield to the explosive forces of the gases and break, and bring another case of "Get a horse."

As nice work must be done with sand, as is done by the pattern maker with the wooden pattern, such work is not done by the ordinary foundryman. He does not need to do it and therefore has not the training which is necessary when it is required of him.

The art of core-making had to be refined to get the best of results. Most foundries refused to undertake work requiring such fine core making and setting. The materials entering into the cores to produce those that will keep their shape, hold the load of iron pressure and at the same time be porous enough to allow easy escape of gases must be well chosen. Then with proper material so mixed and built up into a core, baking must follow to unite the mixture into a solid, strong mass. This baking is of the utmost importance. It is conducted at temperatures not visible to the eye and therefore hard to judge, yet it must be uniform.

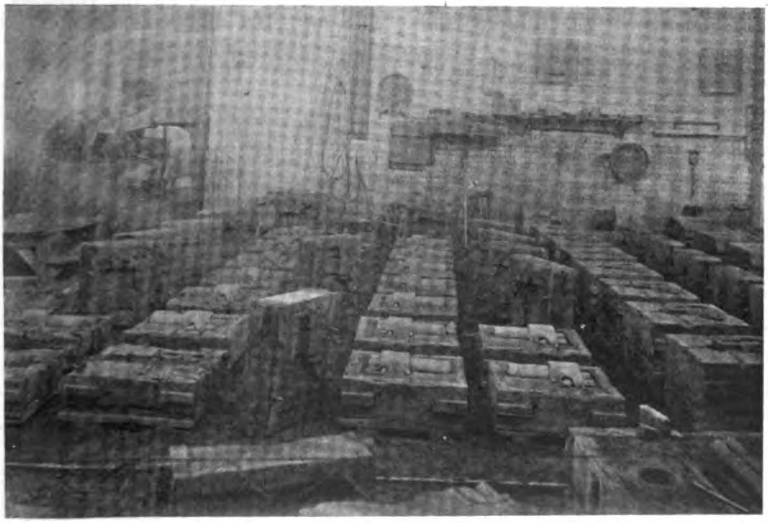


Fig. 4a. Manufacturers' Foundry Co., cores assembled in molds.

The Manufacturers Foundry Company with their two large core ovens obtain accuracy and uniformity of baking by two recording pyrometers that record the temperature at every moment of the day. The night fireman must attend strictly to business and hold the fire at just the predetermined right point or the gauge will tell on him in the morning.

The assembling of the finished core in the sand mould is the next fine point. This, of course, necessitates fine sand moulding to match in nicety the carefully moulded and baked core.

Again we see the reason for the specialist.

A large number of duplications of the same pattern allows the moulder to become extremely accurate. He moulds the same pattern over and over again and learns every little nice detail about it.

With a large number of orders on the same pattern it is possible to build iron flasks in which to mould cylinders. This has been done at The Manufacturers Foundry Company's foundry and greatly assists in the accuracy.

It is seldom that iron castings are inspected under water pressure in a foundry before any machining operations are done, but here such is the anxiety to be sure, that they have rigged up for it and made ingenious plugs to fit in the various holes of the castings, so that a hundred or more pounds water pressure may be turned on to every casting before it leaves the foundry. In this way defects may be detected which otherwise would not be found until the automobile manufacturer had completed at least part of the machining.

Having proper cores and proper sand moulds, the next point and one of great importance is the quality of the iron to pour into them.

Not so long ago it was the practice for iron foundries to buy iron on the basis of fracture, and more particularly on the reputation of a brand, it being the idea that certain brands of iron were necessarily strong or weak.

Thirty years ago this was particularly true. Some brands of iron coming from a district where the phosphorus is high in the iron ore make weak castings; others come from districts where the ore used is low in phosphorus and high in manganese, and that iron is strong. On top of this difference produced by the nature of the ore comes another, depending upon how the blast furnace in which the pig iron is made is operated. Some of them were operated so that they were very hot and they made a soft, weak iron; or others were operated so that they were quite cool comparatively, and they made a correspondingly harder and stronger iron. Now, nearly all the furnaces are run with hot blast and under similar conditions, so that the results produced as far as the furnace is concerned, are pretty much alike.

The differences, therefore, due to brand are thus accounted for in two ways. Both of these differences are detected by chemical analysis, so it makes little difference now what the brand is as long as the analysis is right. With pig irons in the foundry yard of proper analysis any desired quality of product may be produced.

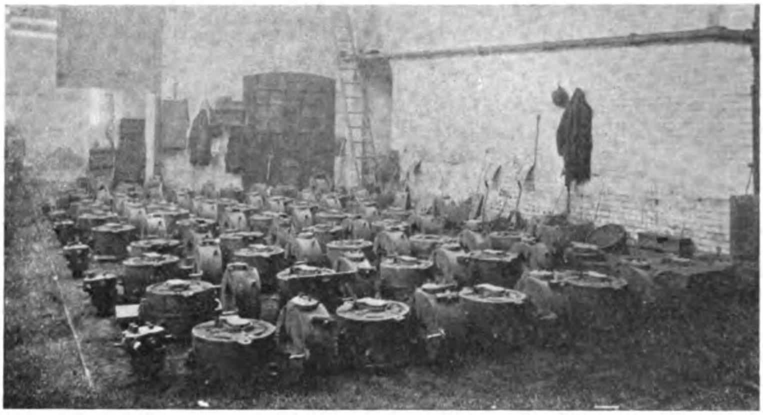


Fig. 5. Manufacturers' Foundry Co., showing uniform flask rigging on one type of cylinder.

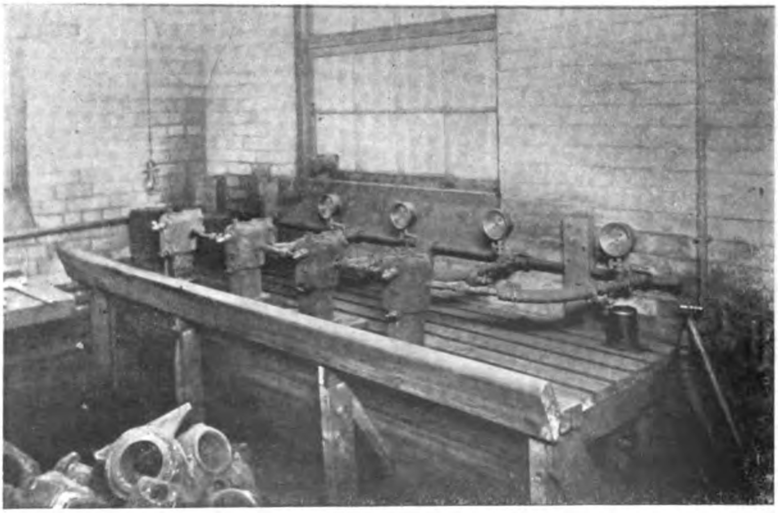


Fig. 6. Manufacturers' Foundry Co., testing bench where castings are tested under cold water pressure.

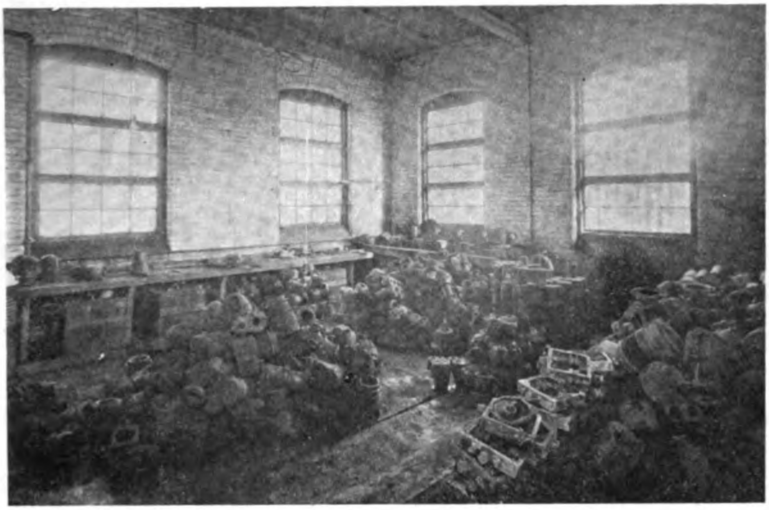


Fig. 7. Manufacturers' Foundry Co., a corner of the testing room.

For instance, if some of the high phosphorus castings like those made in Europe are to be produced, it is an easy matter,—pig iron high in phosphorus may be purchased.

If, on the other hand, extremely strong iron is wanted, irons low in total carbon must be selected and properly mixed as far as the other elements are concerned. Such iron will produce castings like the old-fashioned "Gun Iron" famous in war times.

All these points are under control at the Manufacturers Foundry Company. They employ the services of a metallurgical engineer and chemical laboratory for this purpose.

Their pig irons are so blended as to produce a grade of product that has been found by test, experiment and experience to be most suitable for automobile cylinders. It is, at the same time, strong; easy to machine as far as consistent with strong iron; fluid, so as to make good castings, and free from sulphur and other injurious elements, so as to make clean and sound castings. There is no longer any mystery about making perfect castings if sufficient pains are only taken along the lines above described, and the irons are purchased and used on the basis of their real quality and not some imaginary quality conferred on them by a brand name.

Much stress has been laid upon the behavior of the foreign castings for automobile engine cylinders. The superiority possessed by these engines is the result of the most painstaking machining operations, the accuracy of fit between cylinder and piston rings, and upon the thoroughness of lubrication.

Just as with all other specialists in the world, success must follow the special effort, the special skill acquired in doing one thing over and over again. This specializing and infinite care costs money, however, but it is worth it, and money well spent, because it brings full value in return.

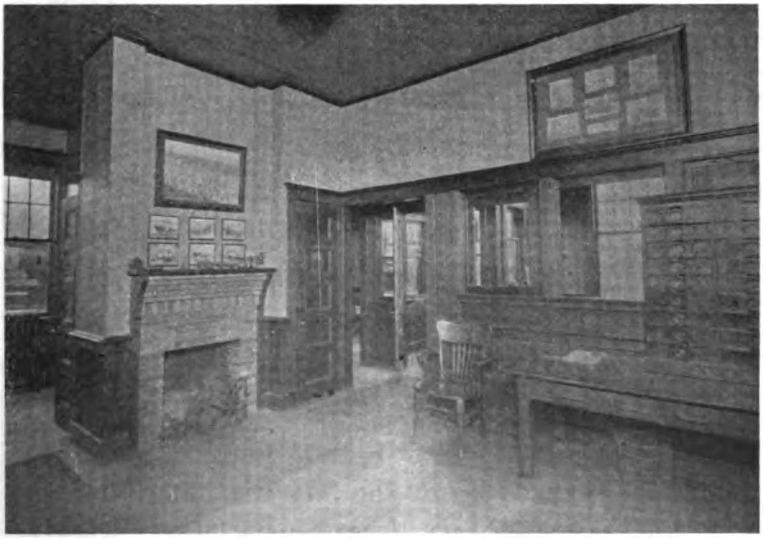
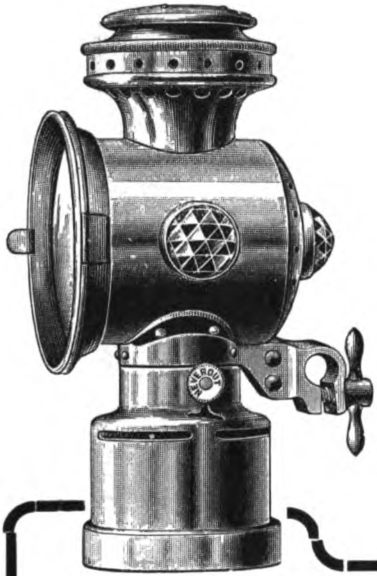


Fig. 8. Manufacturers' Foundry Co. offices.



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The Neverout

Patent

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was the first of the celebrated *Neverout* family.

The name became still more famous with the introduction of

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The Neverout Motor Lamp
The Neverout Searchlight Projector

And now it gathers new glory to itself through

The Neverout Safety Gas Producer

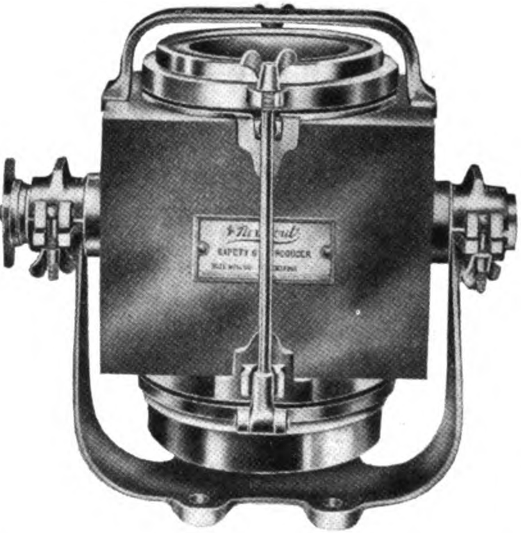
An ingenious device that is distinctly a *Neverout* product and backed up by the *Neverout* guarantee—

Money back if not satisfactory.

Rose Manufacturing Co.
Largest searchlight factory in the world
911 Arch St., Philadelphia, Pa.

See **opposite page** ☞

Make your own gas



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is the only safe method
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Makes gas only as needed—at a cost of less than ½ cent per hour. No gas confined under pressure, no danger of explosion. Instantly lighted and extinguished.

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See opposite page

ELMORE

Announcement

During the New York and Chicago Automobile Shows, 1905, we were approached by hundreds of automobile owners saying, "If you people would only put out a four-cylinder two-cycle car you would simply have the rest beat out of sight. It would be practically the same as an eight-cylinder of the four-cycle type with about one-fourth the complication, and as steady running as a clock." Well, we have built the four-cylinder, and it is all you expected, and more. You may have already heard this from persons who have seen and ridden in it, but you have never heard us say so. We, therefore, take this occasion to announce that it is our firm conviction that not only have we exceeded the most sanguine expectations of our friends, but that in all essential points we have the best four-cylinder car ever built.

Our two-cylinder, two-cycle car is a worthy successor to our Model 11, which, for reliability, as is well known, has never been excelled. It is in the details of construction that we have made our great advance, and in changing from chain to shaft drive we accede to the popular demand for a two-cylinder car of that type. Among the details we have improved, is in using a new planetary gear running in oil, a popular make of circuit breaker, heads cast solid with cylinder, and on both cars we use the famous Hill Precision Oiler. But, as said above, there are so many things we want to talk to you about that we hope you will at once get into communication with us.

We have made so many improvements on our 1906 Models that we have not the space to speak of them here, but our literature will explain them all in such a manner that you will readily see we have a car with the exact features that have been talked of for years as being most desirable, but are impractical on any four-cycle car on account of complication, rhythm of motion, power, etc., but which come perfectly natural to our two-cycle. The action and power of an eight-cylinder car with one-fourth the complication does it all. Ask for literature.

NOTE—Will exhibit in New York City at Madison Square Garden ONLY.

Members Association Licensed Automobile Manufacturers.

Elmore Mfg. Co., Clyde, Ohio

MECHANICAL AND TECHNICAL Department

EDITORS

Gasoline vehicles—Chas. E. Duryea, Duryea Power Co., Reading, Pa.
Steam vehicles—J. A. Kingman, Locomobile Co. of America, Bridgeport, Conn.
Motor cycles—Chas. H. Metz, Waltham, Mass.
General Construction—V. V. Torbensen, Torbensen Gear, Inc., New York.

(We desire our readers to make full use of this department by asking our department editors for advice on all subjects connected with automobiles. We will also grant full use of our columns to those who disagree with the views and opinions expressed in this department.)

NOTICE—Matter for the attention of the Editors of this department should be addressed to the particular editor it is intended for, care of The Cycle and Automobile Trade Journal, and must reach Philadelphia by the 10th of the month to insure insertion in the next number.

Steam Vehicles

BY J. A KINGMAN

Shelbyville, Tenn., Nov. 18, 1905.

Will you kindly inform me what is the size of the bore in the head plates for the copper tubes in the standard Mobile and Locomobile 14 inch copper boilers. Also the exact outside diameter of the tubing used therein, and would like to know what parts of an inch the thickness of tube wall is, as I am not posted on thickness by gauge.

I ask this information so as to intelligently judge when it is advisable to reinforce by thimbles or replace any tubes that may have been made too thin by previous expansions. And would like to also know what is the proper taper to give in making an expansion punch. I think to successfully expand a tube that this is necessary.

When a tube has been expanded to that extent that at the edge or mouth of fire end of tube it is just ½ inch in diameter or will admit a half inch tool. Then is it not advisable to replace or reinforce.

S. W. GARRISON.

The holes drilled in the boiler heads for the copper tubes are 33-64 in. in diameter reamed with a taper reamer (⅝ in. to the foot taper.)

The outside diameter of the tubing is 33-64 in., and the thickness of the wall of the copper tube is almost exactly 1-20 in., measured in fractions of an inch.

J. A. K.

Newburgh, N. Y., Dec. 4, 1905.

I have a Locomobile Steam Runabout and I wish to carry about 50 pounds of air pressure in order to make it steam properly, but I find that when I carry over 30 pounds, that the fire will burn down and out through the sieve at the bottom of the burner. I am unable to determine the cause of this, as I have repaired the burner perfectly, and have adjusted the mixing tube very carefully, and am positive that the trouble is not there. I have thought that perhaps the wind would blow in through the smoke funnel, and down through the boiler, and thus blow the fire down through the burner, and if this is the case, others must have the same trouble, and I would like to know the remedy. Would a pipe leading from the top of the boiler, under the smoke bonnet, and into the exhaust, allowing a jet of steam to blow through the exhaust, remedy this trouble.

I also have another Locomobile, and there is one line of pipe that I cannot account for. On this machine when I received it, there was a pipe leading from the top of the boiler, outside of the smoke bonnet, and entering the water tank, and I am unable to determine whether this was intended to heat the water in the tank, or whether it was intended for a forced draft, and the party had connected it up wrong, by entering the water tank, in place of entering the exhaust. Do you consider it necessary to heat the water in this manner before entering the boiler?

A. W. BOOTHROYD.

It must be that for some reason the gasoline is not properly vaporized so that when you nearly double the air pressure on the fuel, the gasoline is received in the burner in a partly vaporized condition, and thus burns back and causes the trouble you describe.

With everything in good condition, 50 pounds air pressure ought to prevent back firing a great deal better than 30 lbs. air pressure. It may be that the previous owner of the car removed the wire gauze from the tubes leading through the boiler. You do not state whether this is so, and also do not state at what point the automatic operates, which might have some influence in the matter. If you find the gauze has been removed, instead of replacing it run a coil of pipe around the top of the boiler which ought to vaporize the gas sufficiently well without the aid of the gauze and prevent any clogging up at any time.

A forced draft is an excellent thing on the steam cars such as you have, and it might be well to put it on any way. The method of attaching the same has been described several times in the Steam Department in previous issues of this publication.

In regard to the pipe you refer to leading from the boiler to the water tank, would state this was probably put on by the previous owner as a crude means of heating the water tank and possibly to prevent it from freezing in very cold weather. If you examine this closely, you will probably find that the pipe opens into the water tank and the amount of steam can be controlled by the globe valve. A feed water heater is excellent, and almost necessary, and is usually part of the muffler. If your car is an early pattern and is not provided with a combined muffler and feed water heater, you could obtain it from the makers or some supply house.

If the above information doesn't assist you, you might go into details more fully later on.

J. A. K.

November 17, 1905.

I have recently traded my Orient Buckboard for a Mobile Steamer, which the owner claimed had a fire tube boiler new last July that has never been burned. This car is equipped with National Kerosene burner and Ofeldt fuel feed pump.

On my first trip I had no trouble to get up steam but used it faster than I could make it. I did not know what the trouble was until later when I discovered that the boiler leaked, consequently, I could not keep a hot fire. Whether or not the boiler was burned before I received the car I do not know, but it evidently is burned at the present time and when steam reaches 100 lbs. pressure or over it develops great leaking propensities.

This car, as far as I am able to judge, and also is the opinion of my mechanic, is in good condition, and I wish to know if it would be advisable to install one of the new boilers as advertised on the market, such as the Stickney Safety Steam Generator, or the Water Tube Boiler made by F. W. Ofeldt. I do not know the cost of either of these boilers but do not wish to spend too much money on my car. Or would you advise me having my old boiler repaired.

The only use I have for an automombile is for pleasure and I prefer steam for its noiseless running and reserve power.

B. H. R.

It would certainly be best for you to examine the boiler and see if it cannot be repaired before you get about replacing it with a new one. It is suggested that you take it to some machine shop and get bid on expanding the tubes, and if it is necessary to replace any of the tubes, get a bid on this work as well. You should explain to the repair man that the operation of expanding the tubes is a very simple one and it is not necessary to remove the boiler from the car, and that by passing a rope around the front axle, the same may be run over a beam and the car lifted back so as to expose the boiler, the burner having been removed, repairs being thus possible without much trouble. A very light tap is sufficient to expand the copper tubes, and it is likely that your car has a hand pump so that it can be tested by cold water pressure, and if it is tight under these circumstances, it ought to be tight when it is heated up. If the boiler has only been burnt out once, it is very improbable that it could not be made as good as new. If any tubes are required, these should be easily obtainable.

J. A. K.

Gasoline Vehicles

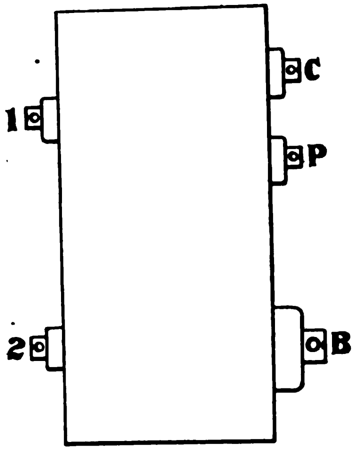
BY CHAS. E. DURYEA

Brockton, Mass., Oct. 29, 1905.

I have a French coil and I do not know how to wire it, will you please mark the wires? I want to use it on a DeDion motor in a boat.

J. D. BALLANCE.

To yours of the 29th. It is impossible to tell by looking at the binding posts only which are the proper connections. It would seem that terminals 1 and 2 are the high tension terminals and should be connected, one with the spark plug and the other with the engine cylinder to complete the circuit. You do not say whether it is for use on a single cylinder engine or multiple cylinder. B would seem to be the vibrator and not intended for connections, so the circuit from the battery could be tried to the other two. The best way to find out is to run a wire from one high tension terminal nearly to the other and watch the spark jump when you connect the battery to the low tension terminal. By bending the wire slightly you can bring the high tension points nearer or slightly farther away, and if the coil is a good one you should get a spark more than ⅛ in. long. Sometimes it is necessary to connect one pole of the battery to two terminals or to connect one terminal with another. A few trials ought to get the proper connection.



C. E. D.

Tokyo, Japan, Oct. 29th, 1905.

We shall be very much obliged to you if you will kindly tell in your magazine whether we can make gasoline light vehicle, using the running gears of the Mobile, Locomobile and Toledo steam light cars by improving their motive power.

According to our idea a light air-cooled double engine of horizontal style will suit these gears, making their weight as light as possible, but as we have no experience in such kind of work, we should like to hear your opinion. In case it can, where can we get any suitable engine for this purpose and also what transmission to be applied for? Kindly tell the name of the factory and also, at the same time, tell the factory that we want to buy their goods and to send any particulars.

There are nearly three dozen of the above cars having boilers leaking and abandoned by their owners. Please kindly state how to place the new engine and transmission, etc., so as to enable us to do the work easily.

THE SORIN SHOKWAI,
T. Yoshida, Managing Director.

We do not think it good practice to rebuild the average vehicle. This is particularly true of the little light steamers. Their wheels, tubular framework, sprockets and chains are not suited to larger power and the strains and jerks which accompany a gas engine.

Further, the room required by the average gas engine and transmission gear is more than can be found in the small bodies of the little steam vehicles. If any of our readers have made, successfully, such an exchange as is above suggested, we are sure it will be interesting to hear how it was done.

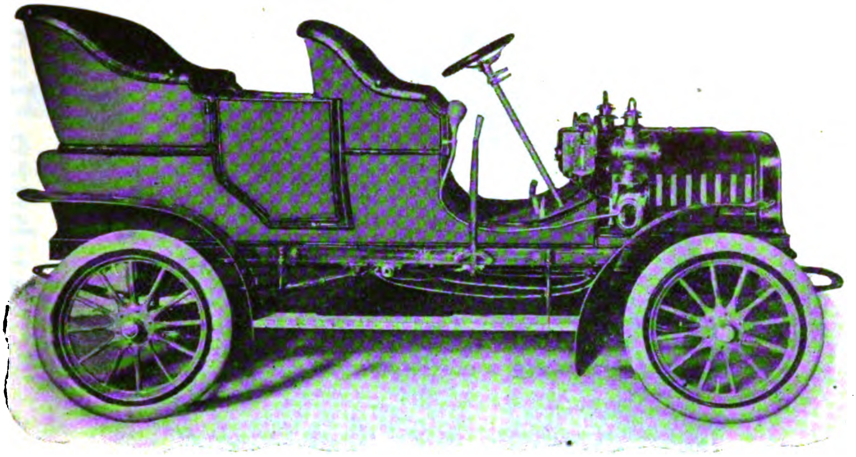
C. E. D.

Mayfield, N. Y., Nov. 22, 1905.

I have a three-wheel car which I use on the railroad and desire to place a small gasoline engine on it. Car weighs 250 lbs. and will carry four, but two is generally what it carries. Car has roller bearings and runs easy. We have some 2 and 3 per cent. grades to climb and against a heavy wind at times. Most of the manufacturers of small motors want me to use a 3 or 4 H. P. motor, but as I do not care to travel faster than 20 miles per hour on level I do not think I need so much power. Drive wheel on car is 16 inch diameter. Suppose I use a 30 tooth sprocket on drive wheel and a 6 tooth on engine. Then suppose engine runs from 1000 to 2200 R. P. M., low speed will be 9 miles per hour and high speed 20 miles per hour. Will you kindly figure on this and tell me the actual power required to propel car when geared as above, assuming car and four will weigh 800 lbs.? If I use rigid sprockets and 1¼ inch motor cycle chain, will chain stand the strain in starting?

C. E. SHAW.

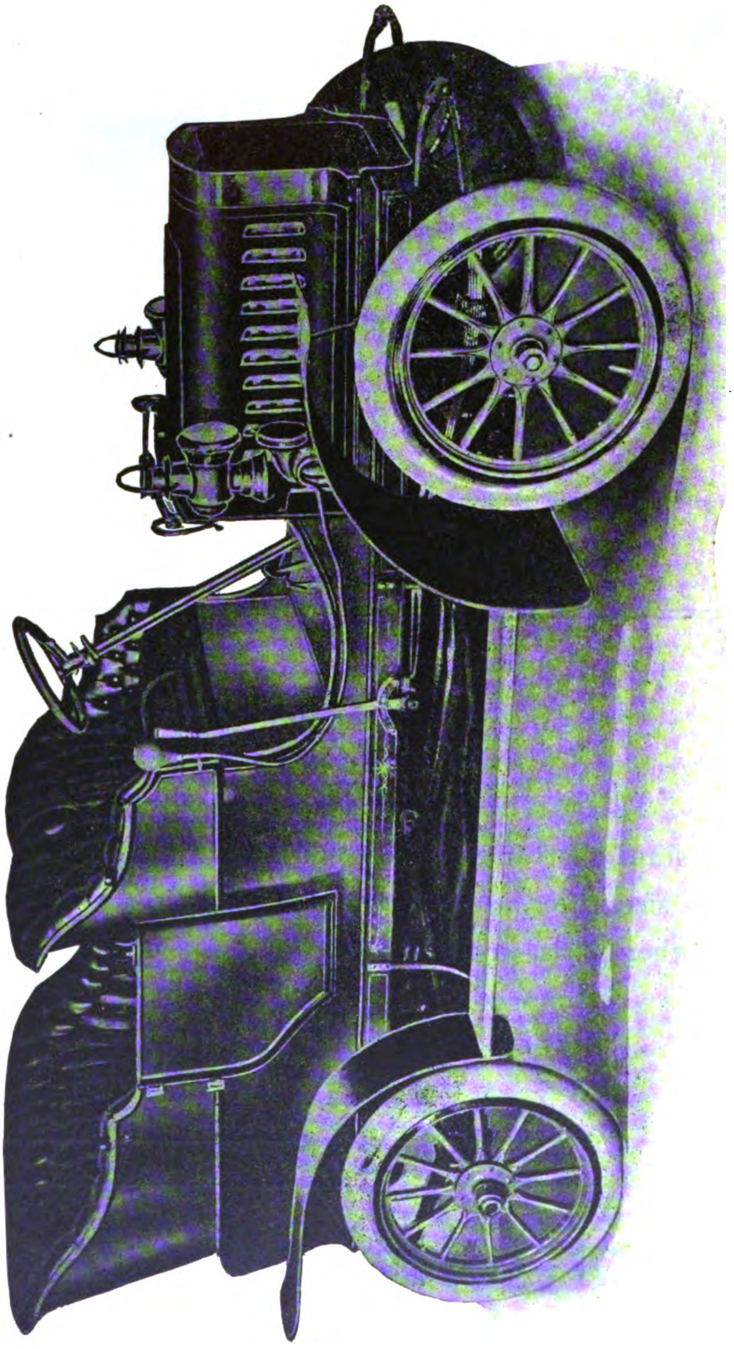
A 3-inch cylinder ought to be big enough to run your little car. A good size motor bicycle motor will doubtless do it. Most people make the mistake at first of getting too little power. The advice given you is undoubtedly good. Better make your engine speeds a little lower and your cylinder larger. The ¼-inch chain will stand the work all right, but will wear out quickly on such small sprockets. Better make the sprockets larger if possible. The actual power required to propel any vehicle depends more on the vehicle than on the theory. Fifty lbs. per ton, draw bar pull, is usually sufficient, but a faulty



1906, Model C, Auburn

This car has a 5 x 5 motor and will do any stunt that any other car will do with the same size motor. We do not care what make the other car is, we make no exception.

Auburn Automobile Co.
Auburn, Ind.



1906, MODEL C, AUBURN

Auburn Automobile Co., Auburn, Ind.

AUBURN

The Auburn is constructed of the best material money can buy and is built and designed by two of the best experts in the world.

Our car runs and runs all the time. We have as little trouble as any other concern in the business. Now what more do you ask. We have the goods at the right price and we are giving you more for the money than any other concern you can name. These are facts and not hot air.

Auburn Automobile Co.

Auburn, Ind.

Details of the AUBURN

PAINT, Royal Blue Body and Yellow wheels. No better job of painting can be done.

WHEELS, 30 x 3½.

WHEEL BASE, 94 inches.

MOTOR, 5 x 5, 20 H. P., guaranteed.

SPEED, 3 to 40 miles, guaranteed.

GASOLINE, 12 gallons.

WATER, 6 gallons.

2 Oil Lamps, complete set of tools and Horn.

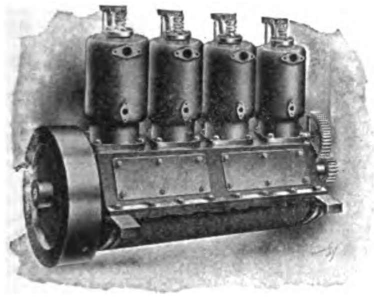
Write us now for terms and agency for 1906.

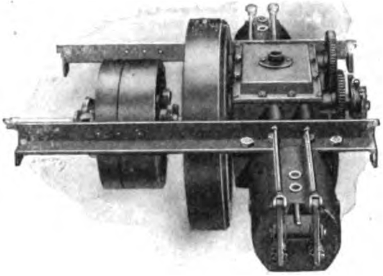
Auburn Automobile Co.
Auburn, Ind.

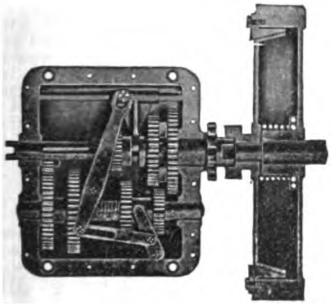
Model Engines, Transmissions and Finished Cars

ENGINES

Double opposed engines, 12 to 24 H. P. Air cooled 4 cylinder vertical engines 20 H. P.
Water cooled 4 cylinder vertical 25 to 60 H. P.



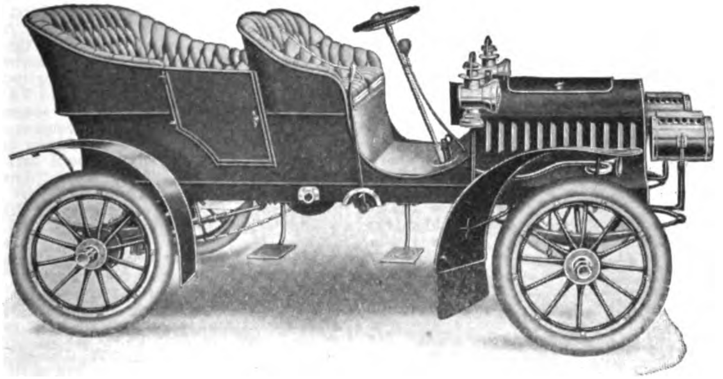




TRANSMISSIONS

Sliding gear 3 forward speeds and reverse either chain or shaft drive.

Planetary 2 forward speeds and reverse also 3 forward speeds and reverse.



CARS

We build four standard cars and guarantee them to have sufficient power to take from 20 to 25 per cent. grades on high speed when geared to 40 miles per hour.

SPECIAL CARS AND TRUCKS

We build special cars and trucks ranging in price from $1,000 to $10,000.

STATIONARY AND MARINE ENGINES

We build a line of single cylinder stationary engines from 2 to 100 H. P. 4 cylinder stationary and marine engines from 15 to 500 H. P.

In writing for catalogue be sure and state size and style on which you are figuring.

Model Gas Engine Works

Lock Box, 2027 AUBURN, INDIANA.

bearing, a dragging brake or a head wind will add much to this. The advantage of having a larger motor is that you can throttle down and use only as much as needed, while if you want more power you have it at hand. C. E. D.

Chicago, Nov. 17, 1905.

I am considering the purchase of a four-cylinder motor, size of cylinders, 5 in. bore by 5 in. stroke. I am offered a motor which the makers claim to have superior advantages, on account of offset cylinders, and in this particular machine it is 1¼ in. with a 13¼ in. connecting rod, with pistons 7 in. long.

I have been very much interested in your various articles, and I understand that you are the originator of offset cylinders.

I am informed that the offset above mentioned is too great for this size of motor, but it seems to run smoothly, and develop its rated power.

If it is not infringing too much upon your valuable time, I would be pleased to have you inform me regarding offset, and also whether there is any rule regarding offset, which should be followed.

I am well pleased with this motor, and if the offset meets with your approval, shall purchase same.

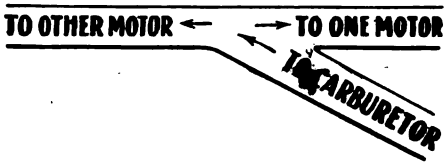
ARTHUR F. NELSON.

There is no doubt about the advantage of offset crank shafts in a gas engine intended to run in one direction only. How much the shaft should be offset is a debated question. The practice followed in Duryea engines which have proven very satisfactory, is to make the offset one-third the crank length or one-sixth of the stroke. Some authorities have claimed that the offset should be one-half the crank length or even more. If the motor is otherwise satisfactory the amount of offset stated will not hurt it. The long connecting rods are decidedly in its favor anyhow. C. E. D.

Chicago, Ill., Nov. 20, 1905.

I have a new 5x5 opposed motor, which I can not get to fire equal. I have a 1¼ in. Kingston carburetor, and intake pipes are divided equal distance to carburetor. When one cylinder is adjusted for slow speed the other fires alternately and vice versa; in other words, one cylinder requires a little more opening of gasoline valve than the other, but when spark is advanced and throttle opened, motor fires nicely. Do you know of anything I can do to make motor fire even on slow speed? READER.

It would seem that your motor does not hold its compression. Quite likely one motor leaks through the inlet valve and fouls the charge for the next, or it may be that the supply pipe presents a different path to the gases passing to one motor than to those passing to the other motor. The writer once saw a motor of the double opposed type connected to the carburetor by a Y joint, but this joint lay on its side as though it had been improperly connected. The designer may have known what he was about, but the result indicated that he did not. Being piped as per sketch, any liquid from the carburetor would be drawn into one engine following along the lower side of the pipe, but no liquid could reach the other engine for self-evident reasons. The result of this was that one motor got a rich mixture, the other a poor one, and neither just right. C. E. D.



2-Cycle Engines

Cleveland, O., Nov. 20, 1905.

Having been a student of gasoline motors and automobiles and having read the Cycle and Automobile Trade Journal for the past four years, I take the liberty of asking some questions on two-cycle motors, of which there has been considerable discussion and theorizing in the last few numbers of the Cycle and Automobile Trade Journal.

I am a student at University School here in Cleveland and am eighteen years old. In the last four years I have spent most of my spare time in study of motor vehicles and their component parts.

I have designed a four-cylinder two-cycle engine. Am sending two drawings to you; one a sectional view of the engine and the other a detail drawing of the cylinders. In designing this, I have had to conform it to my knowledge of pattern making, which is very small.

The only changes I have in mind from the drawings are that I shall not use make and break spark, as the drawing indicates, and the head will be a thin flat casting.

This will make the cylinders somewhat shorter. Another change will be longer arms on the crank case.

If I place a screen of fine mesh wire in the inlet passage (where the gas passes from the crank case to the cylinder) will not this screen stop burnt or burning gases from igniting a charge in the crank case?

Will not an aluminum wall ¼ inch thick (wall of the crank case) withstand any such explosion as might occur there if the burning gases passed this screen? The tensile strength of this aluminum is 18,000 lbs.

Cannot a low tension magneto be used with a vibrating coil, combined circuit breaker and secondary distributor to ignite this engine? If this idea could not be used, what is the reason?

How fast should a magneto be run to be used in this way?

What power could I derive from this engine, running fourteen hundred revolutions a minute?

What is the correct way to calculate crank case compression for a two-cycle engine?

Will you kindly criticize any points in the construction of this engine which you think are wrong?

EARL H. SHERBONDY.

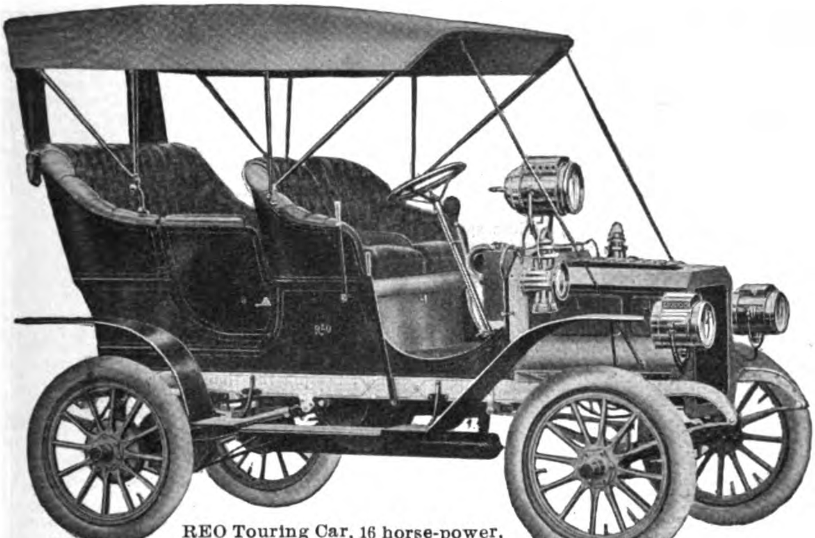
A gauze screen in the transfer passage helps to prevent back firing and is very commonly used for this purpose. An aluminum wall, as you suggest, will be strong enough. The trouble with aluminum castings is that they are sometimes weak in the corners because of the shrinkage stresses. A low tension magneto will not operate a jump coil. There is not sufficient quantity to the spark produced. A magneto for jump spark must be wound to meet the requirements of the case. The speed of the magneto must be determined by the maker. Alternating magnetos are usually run from one to three times as fast as the engine; direct current magnetos five to fifteen times as fast. A single cylinder of the size shown should give 4 or 5 H. P. To calculate crank case compression compare the space of the crank shaft with the piston displacement. If the crank space is twice as large as the piston displacement, the crank case pressure will be about half an atmosphere, or roughly 7 lbs. This partly depends upon the amount of leakage. Your inlet port is probably too short, your deflector too far away from it and your piston weight too heavy. C. E. D.

Columbus, Ind.

I wish to present a few thoughts relative to two-cycle engines for the consideration of the readers of your valuable journal, and would also be pleased to have those who are prejudiced against two-cycle engines to give some consideration to what we have to say. So far as I know all scientific men readily admit that the two-cycle engine theoretically is the ideal engine. But in practice they urge some objections against them, such as inflexibility, liability to overheat, wastefulness of fuel and back firing. I will take up those four objections in the order they are mentioned. 1st. Inflexibility; by this term we understand they mean that the engines are not capable of sufficiently wide enough range of speed. If not, why not? I will give the facts regarding the two-cycle I am using (which we will presume is no exception to this class of engines). We run our engine, minimum speed of which is supposed to be 125 revolutions per min., 625 revolutions maximum.

300 per min. to 1500 per min.
400 per min. to 2000 per min.
500 per min. to 2500 per min.

With these facts before us, we ask to know what is the necessity of greater flexibility when what we already have is seldom if ever utilized, especially when we consider the following facts. I speak now of this engine for automobile purposes. The transmissions on most automobiles have three speeds forward and reverse. Most automobilists set their engine going at a medium speed, and regulate their speed of travel



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REO

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A REO 16 horse-power bus with the same engine as the touring car shown above won the National Trophy and two other prizes in the New York Motor Club's great six-day Economy Test, by carrying its load 682 miles at a total cost (including ferriage) of $2.93 per passenger.

The REO four-seated Runabout (price $675) won the gold medal for cars up to $1500, and one other prize, carrying four passengers 682 miles for $3.38 per passenger.

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by their transmission, but lest anybody might think that this would not be sufficient variation, let us see what would be the slowest and fastest time per mile? With our slowest motion engine, let us estimate that 600 revolutions of the auto wheels drives the auto one mile; that the transmission speeds are 1, 2 and 3, that is, one revolution of the engine on the highest speed gear, drives the auto wheels one revolution, and that two revolutions of the engine on the second speed gear drives the auto wheels one revolution, and that three revolutions of the engine on the lowest speed gear drives the auto wheels one revolution. By this calculation it will require about 14½ min. per mile on the slow speed and 57.6 seconds on the high speed.

Concerning the heat problem, we boldly assert that scientific investigations have proven repeatedly that two-cycle engines do not generate any more heat for the amount of power delivered than four-cycle engines do. We have run our slow speed two-cycle engine more than an hour without any water in the jacket. How much can the four-cycle beat that? Again it is argued that four-cycle engines are filled with fresh air after each explosion. So are the two-cycles! But does not the two-cycles have decidedly the advantage in this respect? for the four-cycle is filled only by sucking the air into itself, while the two-cycle is filled by the air being blown into it by pressure, which it seems to our mind would have a more cooling effect than the other.

About fuel consumption we give facts and figures and leave the reader to draw his own conclusions. We pulled a twenty horse load seven hours on eleven and one-fourth gallons of gasoline. We know of a case where an expert tested a two-cycle for a company that when approached to do the testing said, "he was partial to a four-cycle, but would try to do the two-cycle justice," who, in his report after testing the two-cycle, said, "it developed more power to the amount of fuel used than any engine he had ever found."

Firing back, I am frank to admit that I have been troubled with what I thought was firing over, but I finally made the discovery that it was directly the opposite. I found that in most cases the fire came into the mixing chamber by way of the exhaust port instead of the inlet port. This can occur in two different ways. First, if the suction ring on the piston is not properly fit it will allow the mixture to pass by it (when it is compressing the charge in the crank chamber), thence out at the exhaust port, just at the time the exhaust is being opened to let out the charge just utilized. This fires the escaping charge in the exhaust pipe. Another way for this to occur is for the pitman pin in the piston to not fit perfectly tight in the walk of the piston. Since discovering this fact I look on firing back as a thing of the past. I do not infer that no such thing as firing back ever occurs. I know it does occur; but never without a cause, which cause may be entirely removed.

Notwithstanding all the opposition of men and all the faults that have been urged against the two-cycle engine, it is gaining favor with the people every day. The facts about the two-cycle are too convincing to be set aside any longer, when men are generally convinced of the facts. About those engines in the following points, they will avail themselves of the benefits offered them: 1st. Simplicity, which means durability, cheapness of production. 2d. Economy of fuel. 3d. Economy of both space and metal; a 50 H. P. engine not requiring any more space than a 20 H. P. four-cycle, and not weighing over 500 lbs.
JAMES MARSHAL.

For automobile propulsion I think that the two-cycle will finally triumph, and much sooner than most people think, but the objections against it have to be met in a reasonably practical way to convince, whether by argument or by a machine in operation. There are several different makes of two-cycle machines in operation now that have as great a range of effective speed as the four-cycle. It has only been a few years back that the four-cycle could be regulated effectively except by late spark, which would be considered primitive now. And throttling the intake is just as effective on a two-cycle if done the right way, as it is on a four-cycle. Then it is only a question of the heavier the balance wheel the slower you can run either a four-cycle or a two-cycle, and the larger the intake and exhaust ratio to the size of the cylinder the faster the efficient speed in either. Mechanically the four-cycle is much the superior of the two, but the ordinary two-cycle does not perform the functions of a gas engine as positively and as completely as a four-cycle does, but the best designed ordinary two-cycles of to-day come very close to it, but have the bad reputations of the earlier machines to live down. The real triumph of the two-cycle will be when a new factor is brought into it that will make it positively perform the gas engine functions as well or better than the four-cycle does, or some way of positively getting rid of the carbonic acid gas left in a cylinder after an explosion. What Mr. Marshal says about the fuel consumption in his engine, 20 H. P., seven hours on 11¼ gallons of gasoline, is an extraordinarily good showing, as it would take 14 gallons to do that in a good four-cycle engine. What he says about cooling has no weight. The supposition is that an engine that has an explosion going on in it half of the time, as a two-cycle does, gets hotter than one that has it only one-fourth of the time, as a four-cycle. It has been explained before, in your paper I think, that the exhaust remains in the four-cycle another stroke, making the time equal to the two-cycle, namely, one-half of the time, and that the cooling effect of the incoming charge coming twice as often in the two-cycle makes the advantage in favor of the two-cycle.
C. P. M.

Providence, R. I., Nov. 27, 1905.

Will a two-cylinder two-cycle gasoline motor work all right with cylinders set off on the quarters. I am thinking of firing both cylinders at the same time. I intend to have the two cylinders in line with each other. I thought by having this arrangement I could get a much higher crank box pressure. The cylinders are 4-in. bore and stroke 4 in., air-cooled. The bypass port is 5-16 in. high, 4½ in. around the cylinder; the exhaust port is 9-16 in. high and 4½ in. around the cylinders. Bottom of bypass and exhaust ports are in line with each other. The crank shaft has two throws with offset connecting rods.
A. A. ADAMS.

The engine will work all right if the connecting rods are kept always of exactly the proper length, so that the inlet ports of each cylinder open at the same instant, but if one inlet port begins to open even the one hundredth part of an inch in advance of the other, that cylinder will get more of the charge than the other. The difference in the amount of charge entering each cylinder is much greater than you would at first suppose, because at that instant the crank chamber pressure is the greatest and then rapidly diminishes.

Another objection to any construction that fires two cylinders at the same instant is that they require the same weight of balance wheel and the same power to crank in starting and give practically the same kick as a single cylinder of the same capacity, or power, as the two cylinders combined. If your only object is to get greater compression in the crank chamber, would advise building an engine with 5¾ in. bore by 4 in. stroke, which will give you almost an exact equivalent in every way to the two 4x4 cylinders. Then to get crank box compression make your crank with thin slabs, or arms and crank short and large, and have your crank case sides come close to the crank arms all the way up to near the piston travel. Just leave room so that the piston will be sure to never strike it even when the journals wear down all that they ever can. Make the crank journals as long as you like outside of this case. Ribs and braces to give strength will suggest themselves to you as you get this outline on the drafting board, and you will find you can make it neat, very strong and very light, too. If you think you still want more compression, put aluminum bobs on the crank arms to make a circle of them. You can also fill up the piston all except space for the connecting rod, and core out the inside to avoid too much additional weight. But you can get an abundance of compression without doing that, and any additional unnecessary weight of piston is undesirable.

If one object of having the two cylinders is to lessen the kick, a better construction would be to place them directly opposite to each other. You then get a perfect balance and the least kick possible, but the same objectional features otherwise as before. I infer that the engines are for automobile use, probably direct drive, and that one object is to catch more air for cooling on the two cylinders than you could on one. Better have the crank chambers for each cylinder independent and fire the cylinders as nearly

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MOTOR

alternately as possible and get the benefit of the partial balance of reciprocating parts, ease of starting, lightness of balance wheel and lesser kick, which are the real objects to be attained by having two or more cylinders. If, however, you build a chain drive, place the engines crosswise of the auto, with the exhaust sides of the cylinders in front to catch the air, as the exhaust side of an air-cooled motor will get much hotter than the intake side. The cold charge coming in and shooting up the intake side keeps that side comparatively cool. C. P. M.

Chicago, Nov. 28, 1905.

Is it practical in a four-cylinder two-cycle air-cooled auto motor to use a check valve in the tube between the intake and carburetor, to prevent the back pressure in the carburetors?

CHAS. R. BIXBY.

It is difficult to determine with the data at hand. If the inlets to the crank chambers are ports, as I infer, from their action in making a pulsation backwards through the carburetor, the action may be due to a modification of the same causes that make an hydraulic ram work, except that water being non-elastic and incompressible, the water is hammered, as it were, up to perhaps ten times the height of the column from which it flows, while air, being one of the most elastic substance known, it rebounds back after the crank chamber is filled and before the inlet port closes, but more likely it is caused by the crank chamber being filled to atmospheric pressure before the piston begins its down or crank chamber compression stroke and the piston displacement forces the air out again, until the piston closes the port, after which crank chamber compression begins. If this is the cause of the action, at a very high speed the back flow should be less, as the time for filling the crank chamber would be so short that it would not fill to atmospheric pressure before the port closed. It is an interesting problem, and I would like dimensions of ports, size and stroke of piston, and speed of engine, and at what speed the action is more pronounced. It may throw more light upon the most efficient size and shape to make the intake port, when a piston operated port is used for the intake to the crank chamber. I prefer for the intake to the crank chamber a very light aluminum check valve of large area and small lift, and held to its seat by a light spring. If the valve is hinged instead of a straight lift, it is nearly noiseless, in any case it should be faced with leather to avoid the noise. French calf is the best. With such a valve for the intake the air goes into the crank chamber the whole length of the stroke instead of in one sudden gust. The carburetor works much better, and if it is made right it closes the instant the piston begins its compression stroke and all back flow into the carburetor is avoided and that air is retained in the crank chamber and increases the quantity of charge that you finally get into the cylinder.

Coming back to the question of preventing these back pulsations by a check valve in the pipe to the carburetor. In a four-cylinder two-cycle there would be four pulsations each revolution; at 1000 revolutions there would be 4000 pulsations per minute, and it seems like a difficult problem to make a check valve of sufficient capacity to let through the volume of air necessary, and yet sensitive enough to close against the pulsation 4000 times in a minute, if you ever run that fast, and you probably will, and often much faster.

With four cylinders and good check valve intakes into the crank chamber the flow through the carburetor would be continuous and almost if not absolutely even. Two cylinders are sucking nearly all of the time, the infinitely small space of time that there is only one drawing in air. That one is drawing at its maximum speed and gradually lessening as the next cylinder gradually begins. It is an ideal construction throughout, as the power end of the piston works the same way, the four cylinders giving a constant and nearly uniform push on the crank shaft, taken as a whole. C. P. M.

LUBRICATION OF ELECTRIC MOTOR CARS.

Grand Rapids, Mich., Nov. 15, 1905.

A great many people have noticed that an electric car does not run as free in cold weather as in warm, and it is laid to different reasons. The more prevalent is that the batteries do not work as well when ev are cold. I drive an electric car that has wick oilers in the motor journals and roller bearings in the wheels. I find that it draws from 5 to 8 amperes more in cold weather than in warm, and also decreases in speed proportionately, so I have been trying to discover the reason for this.

When coasting on the down grade with the current off the car runs much slower on a cold day, so I know the trouble is with the bearing, and not the electrical efficiency of the battery or motors. In fact the car seems to climb a steeper grade when it is cold, which also corroborated my theory.

I use sperm oil in the motor journals and dynamo oil in the roller bearings. These oils work fine in the summer, but I think they will not stand a sufficient cold test for winter use. Can you tell me of an oil that will? In my opinion that will solve the problem. I would like to get your opinion on it.

HAROLD B. CHURCH.

Almost any bearing that requires oil in it, will work harder in winter than in summer, as the oil is bound to be more viscous when cold than when warm. I would suggest that a possible solution might be found in the use of graphite along with some other thin mineral oil. F. P. C.

The rules for the Tourist Trophy race to be held on the Isle of Man, England, May 3, provide that the minimum weight of chassis entered shall be 1,300 pounds, but the maximum weight is not stipulated. The main endeavor in the new regulations is to reduce the pace. The fuel allowance is reduced to a 25 mile per gallon limit for gasoline cars, and provision is made that only four change speed gears can be used, excepting where an expanding clutch type of transmission is employed. Each car entered will be required to drive on the level at a pace of 12 miles per hour or slower, without slipping the clutch, in order that the top gear may not be made a mere racing ratio for dropping down the mountain sides. Another regulation is that no exhaust release must be fitted to the muffler. Each car is to carry 1,100 pounds, as against 950 pounds in September last, and as far as possible, standard bodies are required, the backs of which shall have a minimum height from the ground of 49 inches. The trophy will be a reproduction of the statue of Hermes at the South Kensington museum.

W. J. Morgan, promoter of the forthcoming Ormond-Daytona Automobile Tournament, has procured half rates on automobiles from the Florida East Coast Railway. The freight rate from New York or Boston to Ormond, Daytona, or any other point on the line of that railroad will be $1.93 per 100 lbs. These rates will last throughout the winter instead of only the twenty days of the tournament.

Owing to Henry Gray Dinsmore's death, J. Howard Johnson and William F. Hogan, both residents of Paris, were appointed by the Automobile Club of America to represent the club and American automobile interests at the international conference at the Automobile Club of France, December 11-16. The topic principally discussed was the laws enacted for and against motor cars.

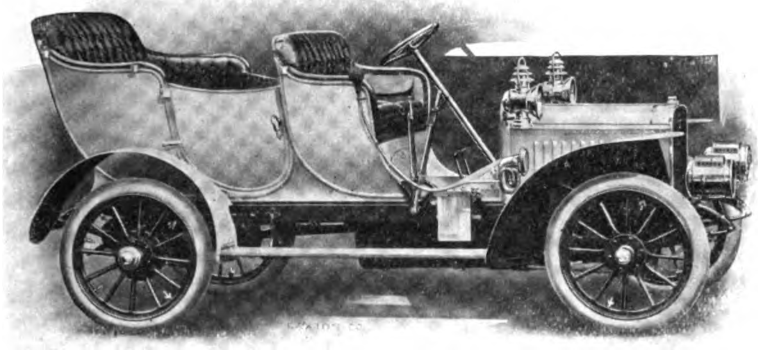
The San Francisco Motorcycle Club enlisted 18 names at its November meeting, making a total of 80 members and is now probably the largest motor cycle club in this country. Club-rooms have been established in the Jefferson Square Building, on Golden Gate avenue.

ANNOUNCEMENT

Cleveland

THE 1906 MODEL F 30-35 H. P.

Is now ready for immediate delivery. A demonstrating car is in commission at the salesroom of our General Eastern Distributing Agent, E. B. Gallaher, 228-230 West 58th Street, New York, also at our Cleveland salesroom.



BRING AN EXPERT WITH YOU

NO other American car is made of such uniformly perfect and high-grade material adapted to the purpose, or so thoroughly and intelligently assembled. There is no car on the American market that will stand up to its work so well or so long. Infinite care is exercised in every detail of construction and the Cleveland car represents the highest and most advanced ideas in automobile building. It is in a class by itself. The complete chassis of the Cleveland car is manufactured by the Garford Company, whose experts have designed and built more high-grade automobile parts and complete chassis than any other concern in America, and the Cleveland is, therefore, the product of years of practical experience.

SPECIFICATIONS:

ENGINE—30-35-H.P., 4-cylinder, water-cooled.

IGNITION—Simms-Bosch low tension Magneto — make and break spark.

TRANSMISSION—Sliding train, 3 speeds forward and one reverse. 5 to 55 miles on third speed.

REAR AXLE—Shaft drive, clutch driven hub. Ball bearings.

FRONT AXLE—I-Beam section. Ball-bearings.

FRAME—Cold rolled pressed steel, aluminum under bonnet covering entire engine and transmission.

WHEEL BASE—104 inches.

WHEELS—Imperial whalebone, grade A, second growth hickory.

TIRES—34x4.

VALVE—Mechanically operated, inlet and exhaust interchangeable.

CARBURETOR—Float feed, requiring no adjustment.

BRAKES—Two internal expansion, dust protected, operating on rear hubs through emergency lever, holding either forward or backward. Foot brake operates on propeller shaft. Both brakes bronze against steel.

BODY—Victoria or double phaeton, tulip side-entrance.

EQUIPMENT—Two head lights, 2 side lights, 1 rear light, 1 horn and tools.

PRICE $3,800.00 to $5,000.00, DEPENDING UPON BODY EQUIPMENT. The 20-H.P. Model D will be continued without change. Price, $2,800. Both models guaranteed for one year. Catalogue and full information on request.

Cleveland Motor Car Co., Cleveland, Ohio

Dept. 2

New York Gen'l Eastern Distributing Agent:—E. B. Gallaher, 228-230 West 58th Street, New York. Boston Agent:—Butler Motor Car Co., 998 Boylston Street, Boston. So. California Agent:—A. P. Worthington, Los Angeles, Cal.

Owing to the unusual interest in the CLEVELAND CAR, agents in unassigned territory are advised to enter into early negotiations.

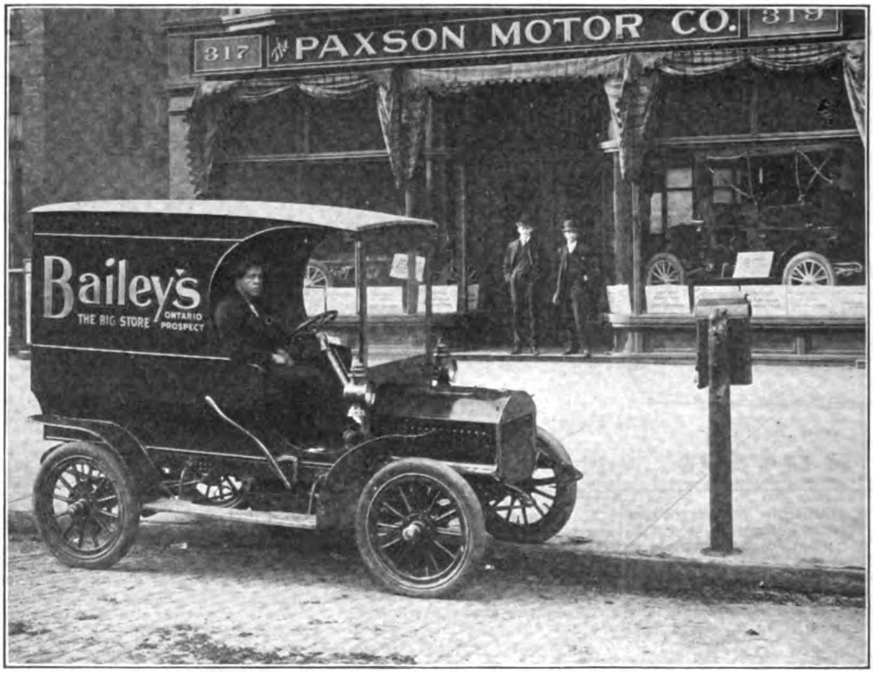
New Cleveland Retail Concern Features the Commercial Wagon

The Paxson Motor Company is the name of a new concern recently incorporated, who have opened a salesroom and garage in the Pythian Temple Building, 317-319 Huron St., Cleveland, O. The company have two large salesrooms and a large basement which is completely fitted up as a garage and repair shop. The basement is accessible by an incline leading to Erie St., and makes a most convenient method of entrance and does away with the necessity of an elevator, and the nuisance of cars entering from the front.

The company is headed by C. D. Paxson, president and general manager, who was for years connected with the Pope Company, and later was sales manager for the Ohio Motor Car Company. The company is amply financed and with such an able manager, its prospects are very bright.

The company is making a strong bid for commercial wagon business and Mr. Paxson has already placed several delivery cars with Cleveland concerns. Mr. Paxson being unable to secure a line of delivery cars suitable for this trade has made arrangements with a well-known manufacturer to supply him with complete chassis which he fits up to suit the tastes of his patrons. This car, which is called the Paxson, has a double opposed water cooled motor, cylinders 5¼ bore x 5 in. stroke, giving 20 H. P. Transmission is planetary, but contains only spur gears. Control is by one lever, which gives two speeds forward and one reverse. Any make of tires are supplied. Steering gear is Brown-Lipe. Frame is pressed steel. Bearings are roller and ball for end thrusts. Any make of carburetor is supplied. Brakes are double band on rear wheel hubs. Body made to suit purchaser. Wheel base is 90 in. Price from $1000 to $1200, according to body and equipment.

The Paxson Company expect to build between 35 and 50 of the wagons for 1906 trade. Mr. Paxson has had all users of these wagons keep a tabulated cost sheet of operating expenses. Below we give the cost of operating one of these wagons for one month, the wagon in question being used by Baileys, one of Cleveland's large department stores. This record is surely an enviable one. As fast as these cost sheets can be secured copies of them are circulated among other merchants who may be possible purchasers. The scheme is a good one and is bound to work out advantageously to the Paxson Company.

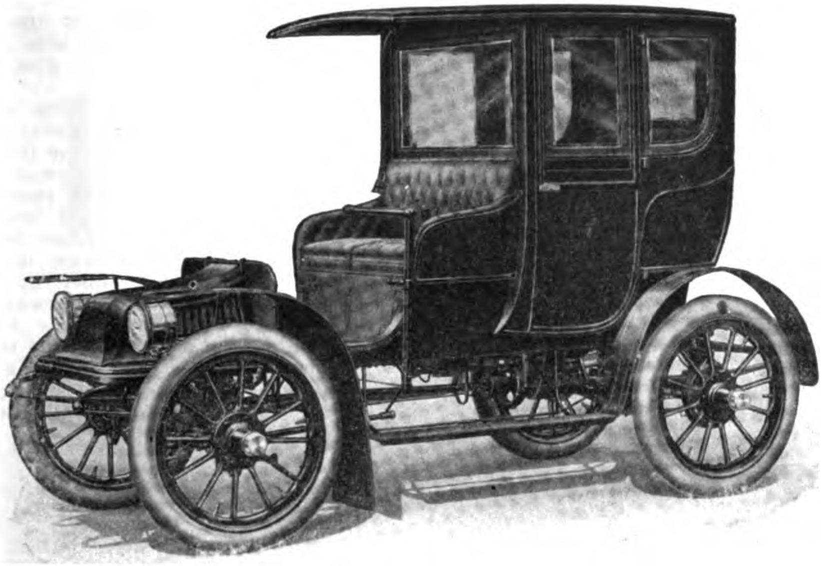


The Paxson delivery used by the Bailey Department Store, Cleveland, Ohio.

RECORD OF FOUR WEEKS WITH PAXSON LIGHT DELIVERY WAGON.

Cost of material	0.00
Cost of repairs	2.12
Cost of machine oil	.18
Cost of engine oil	.70
Cost of gasoline (56 gallons)	6.16
Total for four weeks	9.16
Packages delivered	3570
Miles run	700
Trips made	46
Trips lost	0
Average cost per package	.0026
Average cost per mile	.013
Average cost per trip	.20

Smith & Mabley, of New York City, have secured the exclusive selling agency for Mercedes cars in America for 1906, and will entirely control the sale of Mercedes cars and parts in America.



Baker Electrics

The Aristocrats of Motordom

IMPERIALS STANHOPES SURREYS
DEPOT CARRIAGES BROUGHAMS

Our Depot Carriages is the acme of refined, quiet elegance. Its every appointment is correct. Its finish and upholstery are the best that money can buy and the most skilful labor execute **by hand.** Its mechanical construction is as nearly perfect as long experience in the manufacture of electric vehicles enables us to make it.

ALL BAKER ELECTRICS are extremely light in weight, yet made from such carefully selected materials, with the utmost care and attention to every detail that they are extremely efficient and durable.

The absolute simplicity of operation and ease of control adapts BAKER VEHICLES for the use of anyone and a skilled chauffeur is never necessary.

We desire agents in a few important cities not yet covered and will be pleased to correspond with all who care to arrange for the best and easiest selling line of vehicles in the market.

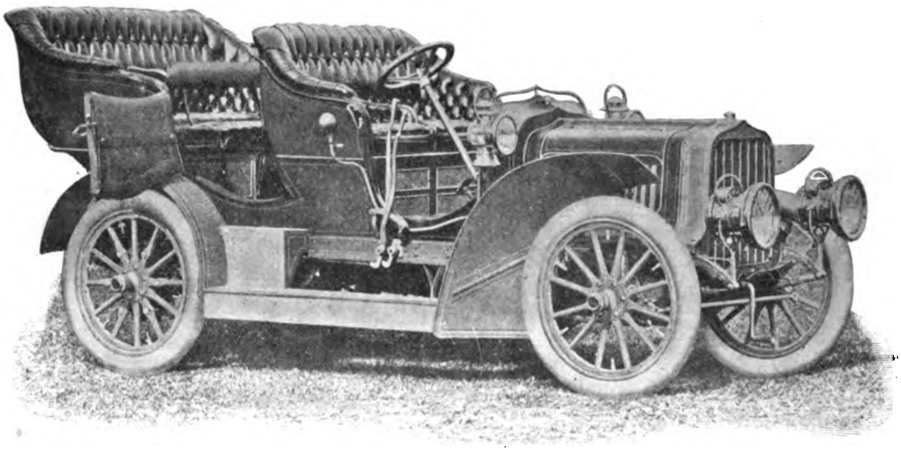
The BAKER MOTOR VEHICLE CO.

18 JESSIE STREET CLEVELAND, O.

1906 Pope-Toledo Type XII

The 1906 Pope-Toledo, made at the Toledo, Ohio, factory of the Pope Motor Car Co., is cataloged as Type XII and is fully up to the usual high standard of Pope products, comprising a large number of good features and being made of the best materials by the best manufacturing methods. The general lines of the Pope-Toledo car have been slightly altered to obtain exceptional elegance and refinement.

The tonneau is very roomy, the rear seat accommodating three persons comfortably, and there is a lift seat between the rear and front seat on which two may be seated, providing for the carrying of five in the tonneau without any inconvenience whatever. This lift, or third seat, is provided with a simple arrangement whereby it may be easily lowered so as to rest directly back of and below the front seat, entirely out of the way.



1906 Pope-Toledo Type XII. 35-40 horse power. Price, fully equipped, $3500.

The double side entrance is wider than on former models, affording ample room for entering and leaving the car. On the inside of each door is located a leather flap pocket of very good proportions, and there is also a triangular flap pocket on the right and left hand side of the tonneau directly next to the pockets on the doors. The upholstering of the front seat and the tonneau is of soft, rich leather, very deep, and so designed as to be very comfortable and easy riding.

The steering wheel proper consists of an aluminum spider and rim on which is mounted above and below half rims of Circassian walnut wood. The steering arrangement is of the irreversible worm and segment type. The control is graduated on the high gear from five miles per hour to limit of speed. Operation is by spark and throttle levers situated on the steering wheel. These are of new design and very easily operated.

The rear mud guards are made of aluminum, oval in shape, following the curve of the wheels; front guards are new style, very wide and fitted with patent leather protection strips extending between engine hood and guard. There is also a patent leather protection strip between frame of the body and running board step on each side of car, affording ample protection from dust, mud, etc.

The frame is of very few parts and is straight sided. It is made throughout of the finest grade of steel obtainable for this purpose, and is tested to a safe load away above what is actually required. The emergency brake, operated by outside hand lever, as well as the foot brake, are of the internal expanding type, engaging a drum on each rear wheel. In applying either of these brakes, the engine clutch is automatically disengaged. The axles are of the I-beam construction and are made from steel testing 110,000 pounds tensile strength to the square inch. The wheels are assembled and spoked by hand in their own factory. Ball bearings of very large dimensions are used. Double chain drive is employed. This car has one horse power for every 54 pounds of weight. This achievement not only provides for less wear on tires, but less wear on all other working parts.

ENGINE

The engine is of the 4-cycle type and twin heads are used. All gears are encased in an aluminum cover so arranged that a magneto may be attached, if desired. The water circulating pump is of the centrifugal type, positively driven by gear from the cam shaft. The carburetor is purely "Pope-Toledo" type of improved design, fed by gravity. The average consumption of gasoline under ordinary touring conditions is one gallon for every 17 to 18 miles.

The Hill Precision Mechanical oiler used on "Pope-Toledo" cars is designed especially for their use. It is located on the engine arm close to the exhaust pipe, thus providing for a proper temperature of the oil under all climatic conditions. But one pump is used for the entire set of 6 feeds, no check valve being used in any portion of the lubricating

19

06

SIX YEARS OF DEVELOPMENT
::: QUIET, SMOOTH-RUNNING :::

22=24 H. P. Four=Cylinder

DEERE

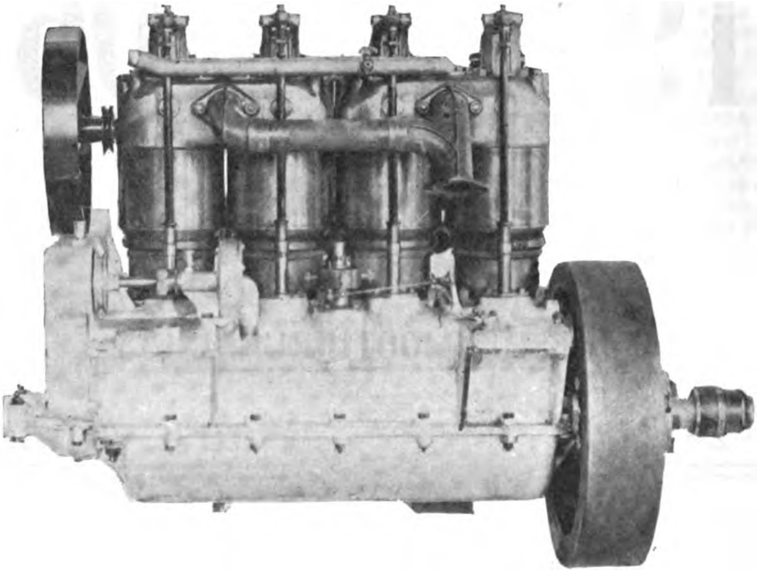
Long Wheel Base
1800 Lbs.

Perfect Ignition
32 x 4 in. Tires

It's just what you are looking for

DEERE=CLARK
Motor Car Company
MOLINE, ILLINOIS

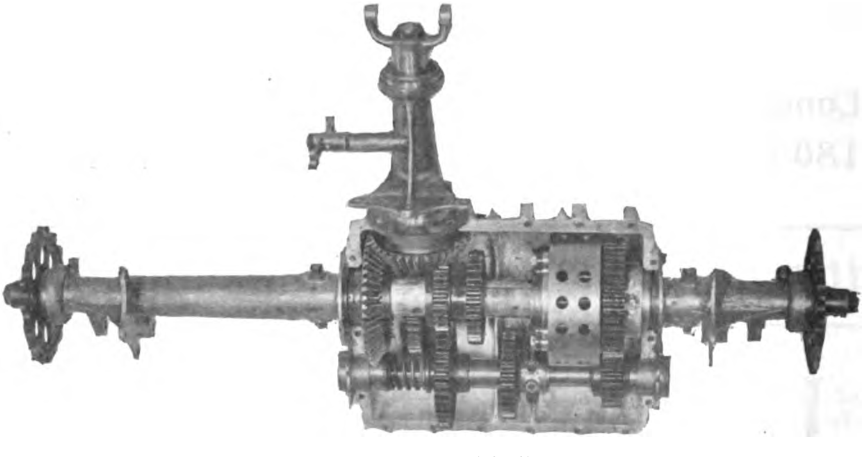
system. The feed is positively automatic, requiring absolutely no attention after having been adjusted. Sight feeds located on the dash are of simple design encased in a polished brass housing and plainly show tne quantity of oil that is being forced through each feed tube leading to all parts requiring lubrication.



Engine of the Pope-Toledo Type XII.

The muffler is so constructed as to perfectly silence the exhaust with a minimum amount of back pressure.

In this "Pope-Toledo" engine, in addition to the other special features, the very remarkable accomplishment has been attained of securing one horse power for every 10.8 pounds of engine weight without sacrificing in any particular the necessary strength and durability; also the engine gives 1 horse power for every 54 lbs. of complete car weight.



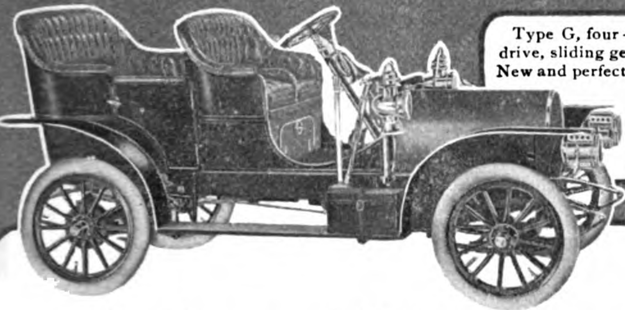
Transmission of the Pope-Toledo Type XII.

TRANSMISSION.

The accompanying illustration of the transmission shows the general arrangement of the gears and the gear box or transmission case, which is aluminum alloy in two parts, divided horizontally. The transmission is of the sliding gear type, providing three speeds forward and the reverse, and giving direct drive on the high gear. It is suspended upon transverse cross members of the frame. In addition to this support, the jack shaft brackets are hung between and rigidly bolted to the vertical flanges of the side members of the frame. This arrangement forms one complete and secure unit of frame and transmission, preventing any loss of power between engine and sprockets, due to wringing and twisting of the frame.

The brass bushing supporting the differential gears has been greatly lengthened and

FRANKLIN



Type G, four-cylinder light car; air-cooled, shaft-drive, sliding gear transmission, 3 speeds and reverse. New and perfect disc clutch; 4-feed oiler on the dash; side doors; 38-inch wheel-base; 4 passengers; 35 miles an hour; 12 Franklin horse-power; 1400 pounds. Full head- and tail-light equipment. $1800 f. o. b. Syracuse.

Why the astonishing fact that this light car, rated at 12 "Franklin horse-power," does more, on average roads, than any other car rated at 20 horse-power?

First: the real proportion of usable power is more than 12 to 20. Other cars are rated at the maximum horse-power of their engine, running *in the shop under ideal conditions*. Franklin cars are rated at the power they develop under the practical average speed *on the road at 20 miles an hour*.

Then: weight. Franklin air-cooling means a light engine and light construction throughout — no water or water-cooling apparatus; no heavy frame to carry them. At least 200 pounds saved on weight construction.

Then: little power lost between the engine and the rear wheels. The same engineering ability that designed and refined the marvelous motor has refined and saved power all over the car. Other cars lose enormous amounts of power in the clutch, transmission, joints in the shaft, bevel-gear, rear axle bearings—power is lost everywhere. In the Franklin this loss is trifling. This is a matter of fact and proof, and we have gone to the bottom of it.

Then: vibration. This is of enormous importance. It uses up power to shake a car, as it uses up power to shake your fist. A rough road reduces the power of the average car 50 per cent or more, and a very rough road often stops the car altogether. The Franklin full elliptical spring suspension, with its flexible wood-sill, takes up the vibration, leaving the working parts free to do their work.

Not one reason but a dozen, all thought out and worked out with the same thoroughness and disregard of precedent which invented the Franklin four-cylinder air-cooled motor, when all the other American makers said that four-cylinders were unnecessary and that air-cooling was impossible.

Send for the Franklin 1906 catalogue — by far the handsomest motor book ever made — which tells about

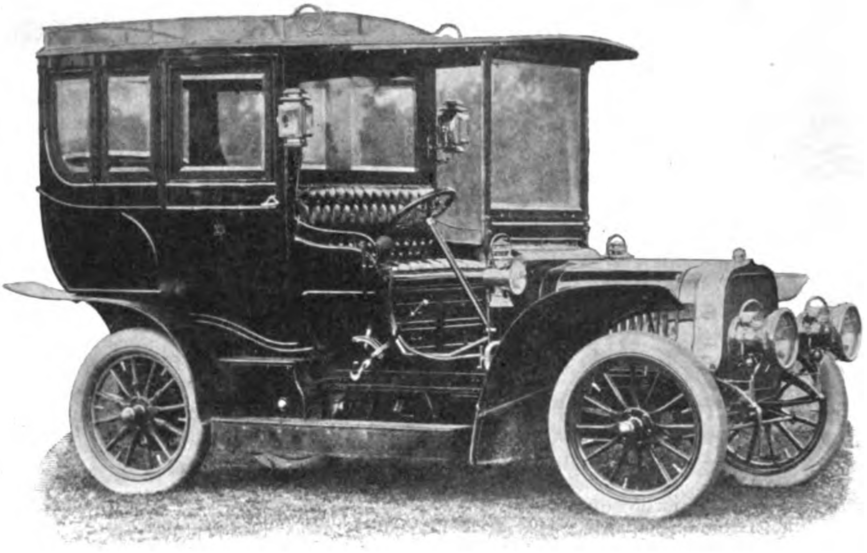
4-cylinder 12 h. p. Runabout, $1400.	**4-cylinder 20 h. p. Car $2800.**
4-cylinder 12 h. p. Light Car, $1800.	**6-cylinder 30 h. p. Car $4000.**

Prices f. o. b. Syracuse, N. Y.

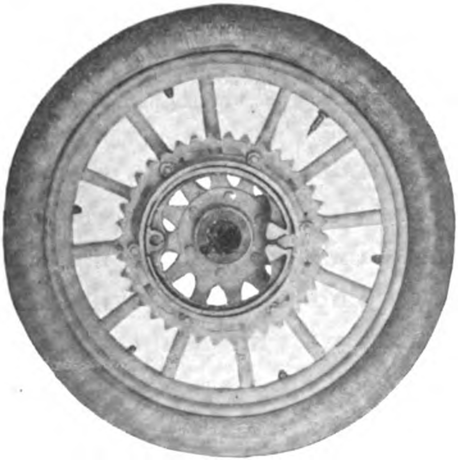
H. H. FRANKLIN MFG. CO., Syracuse, N. Y., *M.A.L.A.M.*

"The Motor Car of the Future"

stiffened, maintaining the joined ends of the two jack shaft members rigidly true to one another. The bearing system has been greatly improved, rendering the adjustment of the bevels perfectly secure. The bearings on the countershaft are made plain and of bronze for the purpose of precise alignment, and to maintain their alignment under severe strains and the wear of daily use. Under heavy strain, the gears of the transmission are liable to be removed from their proper mesh by separation, should the transmission casing not be sufficiently strong. The bottom of the "Pope-Toledo" transmission case is strongly built throughout and is heavily reinforced by webs outside and inside. The casing is, therefore, absolutely rigid, and keeps the gears in proper mesh, regardless of any strain that may be brought to bear upon it.



1906 Pope-Toledo Type XII with Limousine Body. Price, $5000.



Wheel of Pope-Toledo Type XII, showing brake and sprocket.

On the upper half of the transmission case, to prevent the gears shifting from their proper mesh, a rod operates a rocker arm and withdraws a plunger from holes situated in the moving gear shipper rod. This is a sort of breech locking mechanism, making it impossible to shift the gears until the clutch is fully withdrawn. When the gears are shifted and the clutch released, a spring throws this locking mechanism back into position centreing the gears into perfect mesh.

All the gears, shafts and other vital parts of the transmission are made from specially treated steel testing 225,000 pounds tensile strength to the square inch. This steel necessitated excessively expensive experiments extending over a long period of time, but the results obtained more than justified the effort and outlay. Gasoline is fed to the carburetor by gravity.

Type XII. can be furnished with landaulette, limousine or special bodies. The limousine shown herewith lists at $5000 fully equipped. It has roomy double side entrances and is upholstered and finished to specifications. Accessories include speaking tube to chauffeur, silk curtains, arm rests and toilet cases. A radiator is placed in floor for heating purposes. All windows in the body drop down, and are fitted with anti-rattling devices. The car is lighted with an 8-candle power electric lamp. A lift third seat is fitted in the tonneau, facing the rear, to accommodate two grown persons.

L. J. Mueller, Cleveland, Ohio, will have a number of motor cycles and tricars at Palm Beach, Florida, for the purpose of conducting a motorcycle livery during the winter.

Olds Motor Works, Lansing, Mich., has been awarded a gold medal for its exhibit at the Lewis and Clark exposition, Portland, Oregon, last summer.

Don't Fail

to hear Mr. B. A. Gramm's
talks on

The Logan

That Car of Quality

at the New York Automobile Show, 69th Regiment
Armory, Section E, Basement.

THIS IS OUR 1906 LINE

Runabout	10 H. P.	Air Cooled
Light Touring Car	20 H. P.	Water Cooled
Large Touring Car	30 H. P.	Water Cooled
Light Delivery Car	10 H. P.	Air Cooled
2-Ton Delivery Truck	30 H. P.	Water Cooled
20 Passenger Bus	30 H. P.	Water Cooled

Every feature of the 1906 **Logan** Cars is founded on experience.

Made of the best materials obtainable and every car is thoroughly tested before leaving the factory.

Write for Catalogue D-1 giving description and prices.

The Logan Construction Co.

CHILLICOTHE, OHIO

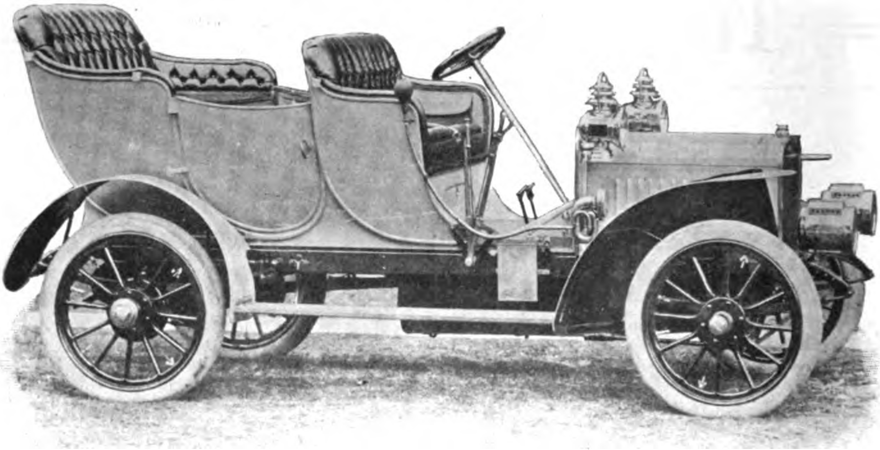
1906 Cleveland Motor Car

BY W. J. GRUBE

The Cleveland Motor Car Co., 380-390 Erie street, Cleveland, Ohio, have just completed and shipped to their New York agent the first 1906 model.

It has a 30-36 H. P. 4-cylinder motor in front, shaft drive, with side entrance Victoria pattern body. Has a wheel base of 104 in., wheels 34 in. diameter, shod with 4 in. tires, weighs fully equipped 2300 lbs. and sells for $3,500.

The complete chassis is the product of the Garford Co., whose executive office is at Elyria, but who have factories at both Cleveland and Elyria. A visit to the Cleveland shop found work on 1906 models well advanced and several hundred cars very nearly completed. The Garford Co. have a very complete factory fully equipped with modern up-to-date machine tools and every part of the Cleveland car with the exception of radiator, magneto and oiler is of their design and manufacture. A great part of the product is made on automatic screw machines, even gear wheel blanks being made in this manner and every care taken to secure accuracy of workmanship throughout. All gears after being cut in the usual modern way and hardened are accurately ground all over, including the teeth, insuring the truth of the surfaces by removing the effect of the warping that may have occurred during the hardening process. High carbon steel is used generously, in fact almost exclusively. To quote the words of Mr. J. G. Heaslet, the designer. "Machinery steel has no place in automobile construction excepting for screws."



The 1906 Cleveland 30 to 36 H. P. 4-cylinder car, product of the Cleveland Motor Car Co., 380-390 Erie St., Cleveland, Ohio. Price $3500; weight 2300 lbs.; tires 34x4 in.; wheel base 104 in.; shaft drive; Simms-Bosch magneto, low tension ignition.

The design of the 1906 model of the Cleveland is very similar to the 1905 model. The 1905 model as a whole having shown excellent qualities. The most noticeable changes are that the motor, which has been increased to 30-36 H. P., is fitted with a Simms-Bosch magneto low tension ignition which has proved so popular abroad. In outward appearance the car is considerably improved. Bed is of Victoria pattern with extremely large and roomy tonneau. The rear seat being 57 in. wide, doors are 23 in. wide, the seat is very deep and comfortable, the tonneau is fitted with adustable foot rest held in place by straps and can be moved forward or back, and in addition to the added comfort secured, this foot rest is fitted with door and makes a convenient carrying space.

The frame is of pressed steel, motor being carried on sub-frame hung about 4 in. lower than main frame. Frame is carried on semi-elliptic springs 40 in. long in front 6 leaves, 1¾ in. wide; 45 in. long in rear 7 leaves, 1¾ in. wide.

THE MOTOR.

The motor has 4 cylinders, vertical water-cooled. Cylinder bore 4⅛ in., stroke 5¼ in. Cylinders are cast in pairs with heads and water jackets integral. The water jacket for each pair is fitted with two brass hand plates and two plugs easily removable for cleaning. Valves are all mechanically operated and are 1⅞ in. diameter, and are interchangeable. Plugs over valves are secured by yoke and one nut, valve guides are of hard bronze and secured to crank case in the same manner.

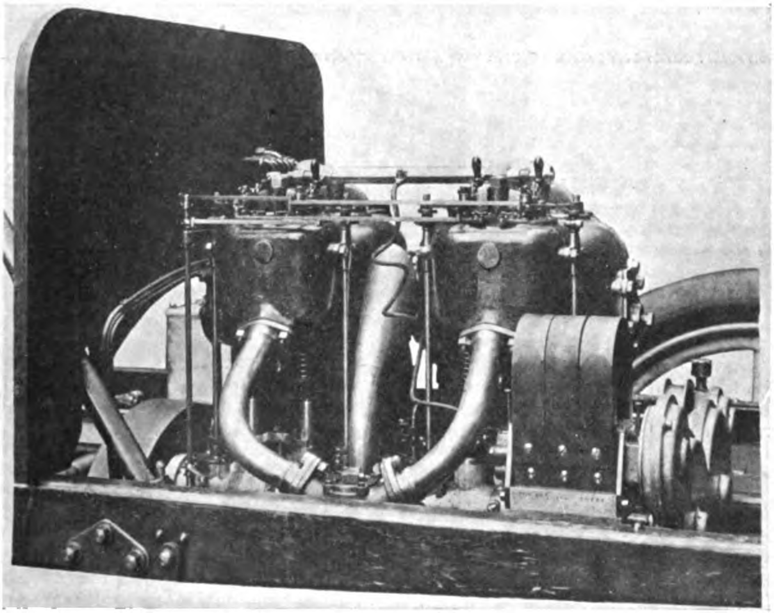
Crank shaft is 1⅝ in. diameter, 2⅞ in. wide at pins, main bearings 4⅜ in. wide at flywheel end, 3 in. wide center bearing, and 2¾ in. front bearing. Flywheel is secured to crank shaft by 6 in. diameter flange forged integral with crank shaft, which is of 50° carbon steel toughened by special process.

Crank case if of aluminum and crank is secured to upper half of case by 6 ¾-in. 50° carbon steel studs, which pass entirely through crank case with castle nuts and split keys on both ends. These studs take the thrust of explosion. The lower half of crank case is a removable oil pan, held in place by studs and nuts.

Connecting rods are of H section nickel steel only ⅛ in. thick in web; piston end is hardened but not bushed; crank pin end brasses are of hard bearing bronze.

Piston is of hard grey iron fitted with 4 rings tongue lapped. Pistons, cylinders and rings are ground all over.

Piston pins are hollow and no pains are spared to make reciprocating parts as light as is consistent with strength. Valve cams are forged integral with cam shaft and are of large diameter and case hardened. The large diameter of cams eliminates a large percentage of noise. The half-time gears are of bronze cased in aluminum case.



The Cleveland Motor Car Co.'s 1906 30 to 36 H. P. 4-cylinder engine, inlet side, showing Simms-Bosch magneto and ignitor mechanism.

IGNITION.

Ignition is by Simms-Bosch magneto, which is mounted on an extension cast integral with crank case. It is gear driven by spur gears and armature revolves at the same speed as the engine crank shaft. The ignition mechanism is mounted in plugs over the inlet valves, which are held in place by yoke and one nut and are instantly removable. The plugs have planed grooves which register with the feet of the yoke and assure the igniter being replaced in correct position. The ignition mechanism is operated by four vertical shafts ⅜ in. diameter, which are driven by bevel gears on the half-time shaft. The cams that operate the trip to igniter are clamped to the top of these shafts and timing is accomplished by the position in which these are set.

A convenient arrangement for timing valves and igniter are marks on flywheel and index on crank case. Igniter points are of imported nickel alloy, fixed points insulated with mica. The fixed point can be removed without disturbing any other part. The movable point is fixed on the sleeve with a spring between it and the operating lever, which assures it being held in firm contact.

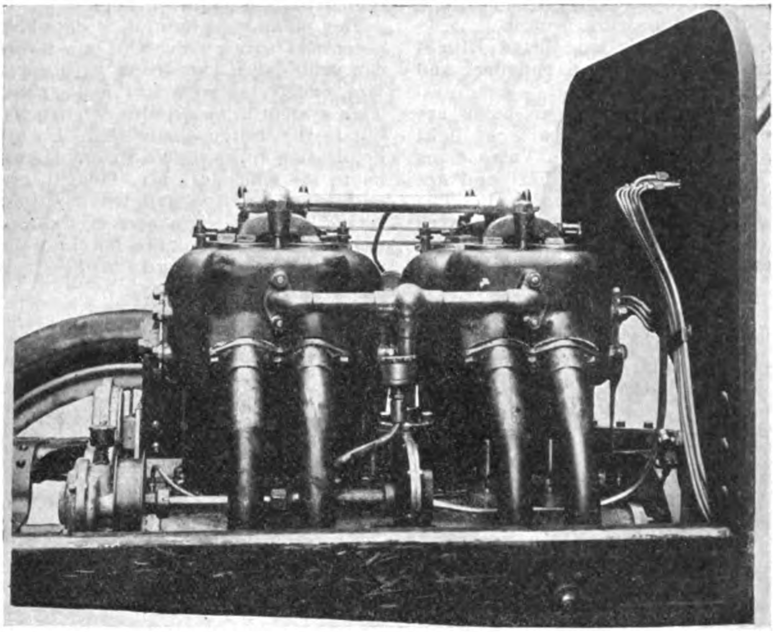
The advance of ignition is obtained by four eccentrics which move the trip levers in unison and cause the spark to occur early or late, exactly as with the jump spark system. This system is used quite extensively abroad, but to the writer's knowledge this is the first application to an American made car. Asked as to its efficiency, Mr. Heaslit grew quite enthusiastic and said it was possible with it to get a much more correct timing and the spark was always quite hot and the charge need not be fired so early in the stroke, thereby giving more positive and less negative work than with the jump spark system.

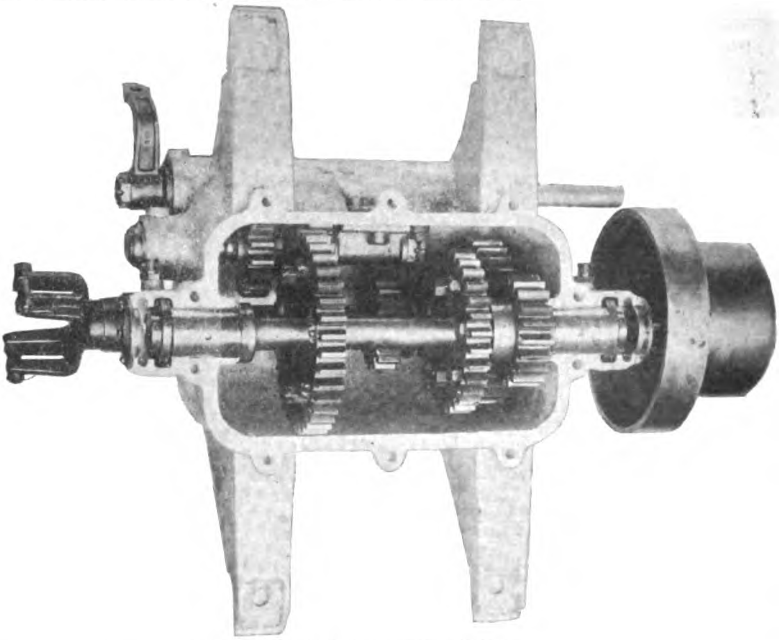
With this simple mechanical igniter the timing is boys' play, and it does entirely away with spark coils, vibrators, timers, spark plugs, oil soaked insulation, and batteries. All parts of the igniter mechanism are hardened and ground and the system is undoubtedly a step in the right direction.

TRANSMISSION.

Transmission is by a sliding gear, giving three forward and a reverse direct drive on third speed. Shafts are of high carbon steel oil hardened and accurately ground to size; two main gears are case hardened, all other gears are oil hardened. Individual gears are bolted to flanges forged integral with shafts, gear bolts positively locked with cotter pins. Sliding train is mounted on squared shaft. The case is oil-tight, of aluminum, with removable cover for inspection. The bearings throughout the transmission are hardened steel bushed and this construction is said to give excellent results. Ring oilers are supplied throughout.

The clutch is aluminum cone leather faced and is extremely light, preventing shock to gears. Universal joint from clutch to transmission prevents any slight deviation of the shafts from true alignment and prevents binding and undue wear in the bearings. The clutch is so arranged that there is no end thrust on engine from clutch.


The Cleveland Motor Car Co.'s 1906 30-36 H. P. 4-cylinder engine, exhaust side, showing pump and water connections.


The Cleveland Motor Car Co.'s 1906 transmission.

PROPELLER SHAFT AND REAR AXLE

Propeller shaft is of 50 carbon steel, oil hardened at the rear universal joint, which is the sliding member, and is of generous proportions. Forks are of high carbon steel oil hardened, pins case hardened. The bevel gear driven rear axle is of the floating type; bearings are ball, the inner bearings containing 13 ⅞ in. balls. The outer bearings 15 11-16 in. balls. The outer and inner pinion bearings each containing 13 11-16 in. balls. Ball races and cones are hardened and accurately ground. The gear and driving pinion are of steel, case hardened 4-in. pitch. Differential case is a steel casting, differential gears case hardened.

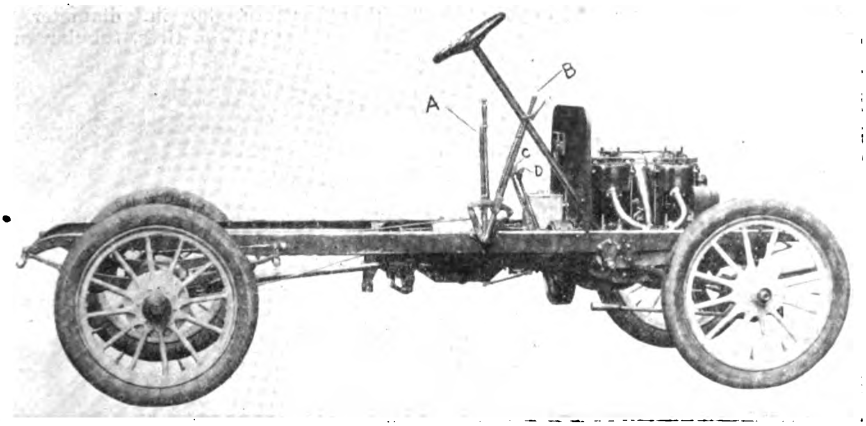
Driving shafts are of high carbon steel squared into differential and driving clutches on hubs, driving shafts oil hardened on squared ends. The case is split horizontally, the upper half is easily detached, allowing differential and gears to be easily removed. Axle tube is brazed into malleable case and wheel bearings are mounted on axle tube.

Cooling system is by positively geared circulating pump, and Whitlock radiator with fan. All water connecting pipes are of brass and easily removed. The pump has flexible connection between shaft and drive gear.

Cooling fan is mounted on forward engine cylinder on ball bearings and driven by 1-in. flat belt.

Lubrication is by Hill precision oiler positively driven with oil leads to all main bearings and sight feeds on dash.

Dash is flat laminated wood with brass moulding. Hood is of new shape, distinctly original.



Side view of the Cleveland 1906 chassis. A is change speed lever; B emergency brake lever; C clutch pedal; D shaft brake pedal.

Brake drums are integral with inner hub flange. Brake is a continuous bronze expanding band cam actuated and holds equally well forward or back. The propeller shaft also carries service brake which is of the clamp band variety.

Front axle is an I beam section nickel steel forging, steering knuckles high carbon forgings oil hardened. Pivots oil hardened, pivot bushings case hardened. The end bearings of both yoke and bed are case hardened. Bearings are ball, the inner bearing has eleven 11-16-in. balls. The outer hub bearing eleven ½-in. balls.

Steering gear is irreversible, nut and screw type. The casing is a malleable casting in single piece, substantially fastened to the frame.

A simple float feed carburetor of the spray type is used and as proved by demonstration gives great flexibility.

Spark and throttle control is located on top of steering wheel operated by button and sector. Change gear and emergency brakes are operated by levers at the side of the seat. The clutch is operated by left hand foot pedal. Brake on transmission shaft is operated by right hand foot pedal. The car seems to have an abundance of power and operates very quietly, the clutch at all times moving the car very smoothly and starting gradually and comfortably. The Cleveland Co. are looking forward to a very prosperous season and expect to market from two to three hundred cars, the majority of which are well under way.

Behlehem Steel Company, South Bethlehem, Pa., (sales department, 100 Broadway, N. Y. City, are now manufacturing for use in automobiles, nickel steel forgings of every description. A drop forge plant, including presses, hammers, etc., has been installed at their works. From the long and varied experience of this company in making and treating the highest grades of steel, they are able to obtain the best possible physical properties. Since the organization of this department about 4 months ago, business has increased to such extent that the entire drop forge shop will be taxed for five or six months to come. In addition to drop forgings, they are in a position to furnish manganese bronze castings, of high physical properties almost equal to those of steel castings.

The Wayne Automobile Co. have chartered a special car, which will be in charge of New York Branch Manager Kull, to visit the New York show, Florida races and the Chicago show.

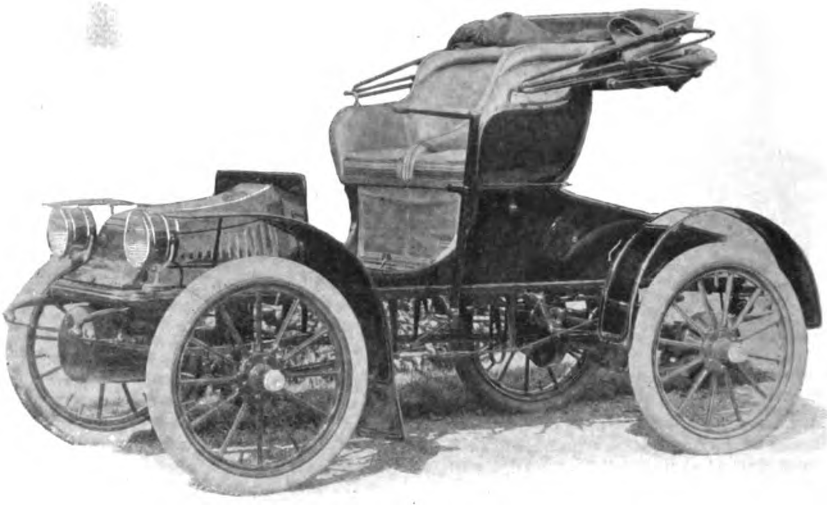
H. C. Shiland has been appointed sales manager for the Buick Motor Co., of Jackson and Flint, Mich., and has his headquarters at the Jackson office. He was formerly branch manager at Chicago.

Baker 1906 Electric Cars

W. J. GRUBE

A visit to the factory of The Baker Motor Vehicle Co., 114 Jesse street, Cleveland, Ohio, found a shop full of activity and work on 1906 models progressing with machine-like precision.

As an evidence of the popularity of Baker Electrics, one only has to stroll down beautiful Euclid avenue, when he will encounter these popular cars by the hundred, a great number of which are driven by ladies and children. In fact in Cleveland one encounters them everywhere. As an evidence of the prosperity that has attended the Baker Co.'s efforts a brief outline of the company's progress will not be amiss.



The Baker Electric Suburban Runabout; price $2000; front tires 34x3½ in.; rear tires 34x4 in.; 2½ H. P. motor; 24 cells of battery; speed 20 miles per hour; mileage 40 miles on one charge.

Mr. Walter C. Baker, the founder of the Baker Motor Vehicle Co., built his first car in 1899. He being one of the pioneer manufacturers of electric machines in the United States. The first shop of the company was a frame structure 36 ft. wide x 130 ft. long, which soon proved too small to meet the demand for the popular Baker cars.

The present home of the company is a modern brick factory building with 34,000 sq. ft. floor space, and is crowded to its utmost capacity and is entirely too small for the company's ever-increasing business and they have a new factory building under way at Edgewater Park and Lake avenue that will have when completed 120,000 sq. ft. of floor space and is expected to prove adequate for some time. They expect to occupy the new building by January 1, 1906. The company have upwards of 500 machines coming through now and expect to greatly increase their capacity when they get into their new quarters.

The Baker line for 1906 comprise seven models:

Baker Imperial.—A chain driven piano box runabout, at $1,200.

Baker Stanhope.—A chain driven Stanhope for two persons, at $1,600.

Baker Suburban.—A speedy shaft driven two-passenger car, at $2,000.

Baker Surrey.—A shaft driven carriage for four persons, at $2,500; with cape top, $2,650.

Baker Depot Carriage, at $3,000.

Baker Inside Driven Brougham, at $3,500.

Baker Outside Driven Brougham, at $4,000.

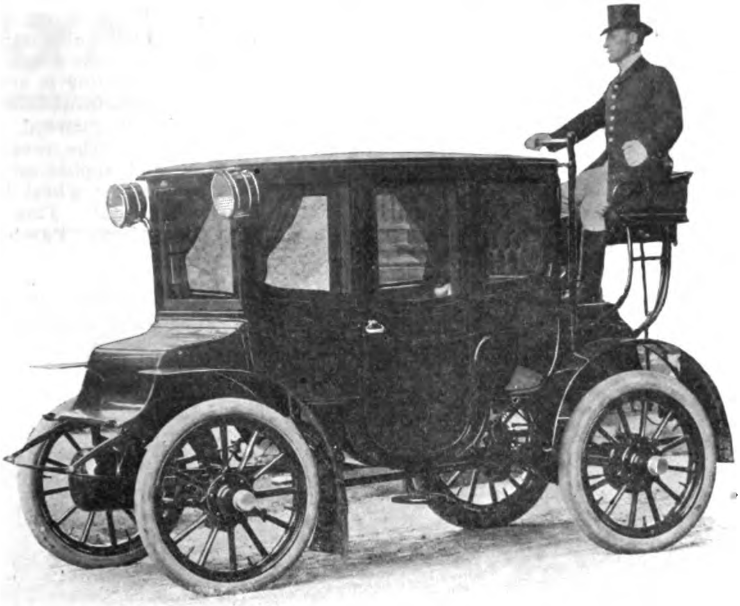
The Imperial piano box runabout, which has previously been illustrated in these columns, has a wheel base of 68 in., tread of 52 in., and weighs 950 lbs. complete with top. Artillery pattern, 30 in. diameter wood wheels shod with 3-in. tires, tubular running gear, ball bearings throughout gear, counter shaft and motor and every care is taken to reduce friction to the minimum.

The very easy running qualities of the car throughout, coupled with its very light weight accounts to a great extent for its remarkable efficiency. It has a normal speed of 14 miles per hour and a maximum speed of 17 miles per hour, and a mileage of 40 miles on one charge of battery.

The motor is of one horse power mounted under the seat, and is direct geared through rawhide pinion and steel gear to the countershaft, which carries the sprocket. Final drive to rear wheels is by ⅝x¾ in. Whitney roller chain.

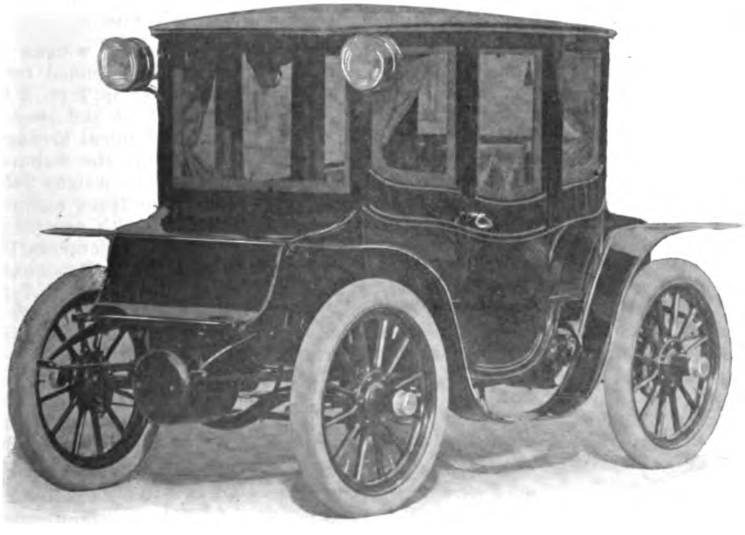
The battery of 12 cells is carried in rear of body and any standard make is used. The company giving the purchaser an option on Exide, Edison, Williard, Gould and North Western.

The motor is a 4-pole compound wound, with rocking brushes, and is started through resistance. The controller by three successive steps cuts out all resistance and the batteries are connected direct on the third position. Additional speed is secured through he compound winding of the motor. This result is accomplished by opening a shunt, hereby weakening the field which increases notor speed, contrary to the usual practice f partially short circuiting the series winding, which is very hard on batteries and otor, especially on hills.



The Baker Outside Driven Brougham; price $4000; weight 2800 lbs.

The controller lever, which is on the left, ushes the knife through the three successive ontacts by a continued forward movement of lever. The reverse motion withdraws switch and applies brake at the same operation.



The Baker Inside Driven Brougham; price $3 00; weight 2100 lbs.; front tires 36x3½ in., rear tires 36x4½ in.

The knife is made in two sections, hinged at top and held together with stiff spring and no matter how slowly switch is withdrawn, the latter half leaves the contact instantly with a spring snap, and the entire arrangement is such that it is impossible to draw an arc and weld switch in contact as so often occurs. In fact Mr. Baker informed the writer that they had never had an accident of this kind.

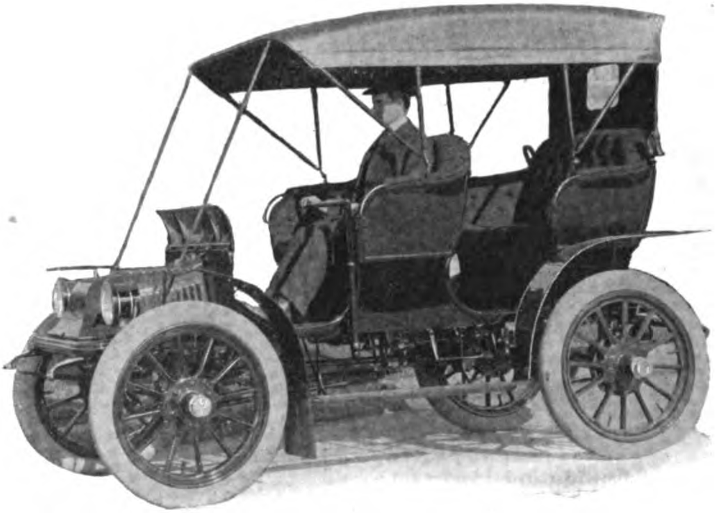
The body is hung on three full elliptic springs 34 in. long x 1½ in. wide, 4 leaves. The car starts and operates very smoothly and as the controller is moved from one contact to another does not have the noticeable jerk so common with electric cars.

In addition to the service brake, the car has a clamp hand brake on rear axle differential drum, which is applied by foot pedal and secured by ratchet.

The steering is by tiller, both steering lever and controller being arranged on left hand side.

The standard finish of all Baker cars is body black, gear Brewster green or blue, trimming green or blue cloth or leather. Great care is taken with the painting and trimming and all Baker cars have a finish that is both elegant and durable.

The Baker Stanhope, another model which has been previously illustrated, weighs 1050 lbs., has the same motor and equipment as the Imperial runabout and is practically the same machine with the exception of style of bed, body and appointments, which are more luxurious. This model has proved exceedingly popular with the ladies and is a very stylish and luxurious carriage.



The Baker Surrey; price $2500; with cape top, $2[illegible]50; weight 2050 lbs.; tires 36x4½.

SUBURBAN RUNABOUT.

The Suburban is a new model runabout just finished for the 1906 season, it is speedier and heavier throughout and is built along the lines of a gasoline car. It has a wheel base of 6 ft. 9 in. tread 57 in. center to center, tires 34 x 3½ in front, 34 x 4 in rear, rear wheels filled with expanding hub brakes. Semi-elliptic springs 44 in. long (5 leaves) by 2 in. wide are used. Motor is 2½ H. P., mounted in front under hood; 24 cells of battery are used. This car has a speed of 20 miles per hour and a mileage of 40 miles on one charge of battery. The motor is hung by special shaped aluminum brackets, bolted on. The drive shafts is on a straight line fitted with universal joint in rear, but has no cardon joint in front as motor supports are damped by rubber bumpers on both sides, which takes care of the allignment at the motor end.

The controller and steering is arranged the same on this car as on all other Baker models and one continued forward motion of lever gives all speeds. The reverse motion withdraws, switch and applies service brake on drive shaft. The rear wheel brakes are applied with foot pedal. This model is equipped with two large Parobolic Head Lights.

Baker Electric Surrey weighs with cape top, 2050 lbs., and is intended for four persons. The wheel base is 7 ft. 3 in., wheels are 36 x 4½, both front and rear. The motor, battery and mechanical arrangement are practically the same as the Suburban.

Baker Depot Carriage weighs 2450 lbs., has 36 x 4½ wheels, both front and rear, wheel base 7 ft. 9 in., and with exception of style of bed is practically the same as the Surrey.

Baker Inside Driven Brougham weighs 2100 lbs., has a wheel base of 7 ft., wheels 36 x 3½ in front, 36 x 4½ rear. Has the same power equipment as Surrey and Depot Carriage.

Baker Outside Driven Brougham is the same as the inside driven, but has driver's seat arranged in the rear and carries more power. The motor is 3½ H. P. Battery 24 cells. Total weight 2800 lbs.

E. R. Thomas Motor Company, Buffalo, New York, have been compelled to enter their new factory before it is entirely finished, and the building of the factory has been going on simultaneously with the building of their cars. The new building is L-shaped, 190 feet in one dimension by 195 in the other, and is three stories high. Particular attention has been paid to the lighting arrangements. Machinery equipment is thoroughly modern. When the factory is completed the manufacture of cars will progress as the parts proceed down the rows of work benches, and by the time they have made the circuit of the room the chassis will be complete.

GAS-AU-LEC

"The Simple Car"

Elegant in Finish
Luxurious in Appointments

Built by Skilled Workmen from the Best Materials obtainable

The Simplest Gasolene Car in the World

Both as to Construction and Control and the easiest to operate and maintain.

Not only eliminates many objectionable features common in automobile engineering, but possesses points of excellence not found on any other car.

Positively self=starting from the seat every time

No cranking under any circumstances.

40-45 Horse Power with Quinby Aluminum Tonneau, $5,000.

Limousine or Special Bodies to Order.

"Marks a New Era in Automobile Construction."

CORWIN MANUFACTURING COMPANY
PEABODY, MASS.

The Welch 1906 Motor Cars

HUGH DOLNAR

The Welch Motor Car Company, Pontiac, Michigan, U. S. A., will offer for the season of 1906 three different styles of motor cars, all using substantially the same chassis: (1) A plain 5-passenger tonneau body, side entrance, doors swinging to front, fitted with a cape-top as an extra, this being a new 1906 model; (2) a 7-passenger tonneau body, side entrance, doors swinging to rear; and (3) the same 7-passenger body fitted with Welch Bros. patented detachable Limousine top.

The Welch cars are all driven by one style of motor, the same in principal members as used since 1903. The four cylinders were first 4½ in., as described in these columns October 1, 1904, and the 1906 Welch motors will be 4⅝ bore by 5 in. stroke. These motors, it will be remembered, have the cam shaft on top of the cylinders, valve levers and valve stems set at about 45 degrees to the vertical plane, intake and exhaust levers for each cylinder worked by the same single cam. This Welch 4-cylinder motor (4⅝x5) shows over 50 brake horse power at 1250 revolutions per minute, which drives the car from 40 to 65 miles per hour according to the gear reduction ratio selected. The Welch cars are geared to suit the weight of car and the roads upon which the car is expected to be driven.

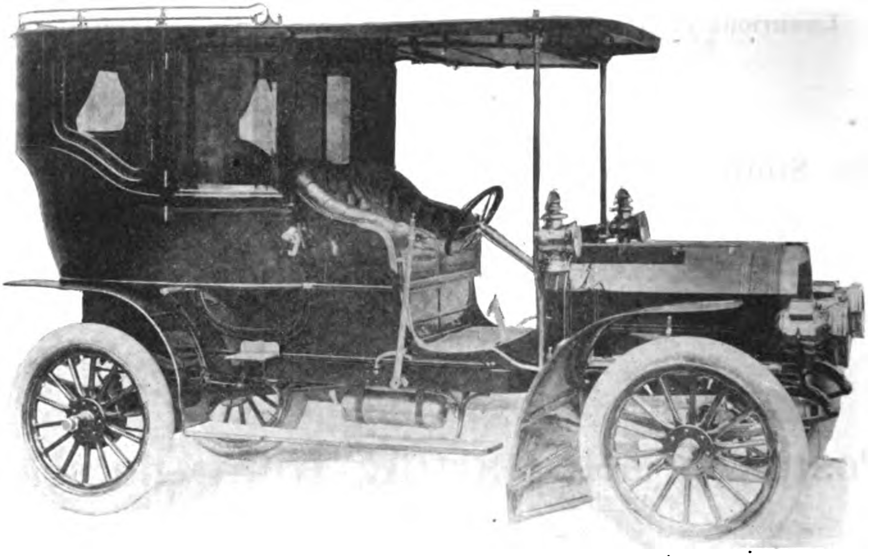


Fig. 1. 50 H. P. Welch "Pullman Limousine," showing the Welch patented limousine top applied to the Welch 7-passenger tonneau body; weight 3500 lbs.; interior heated by exhaust and lighted by electric light.

Welch Brothers were the first American motor builders to place the cam-shaft on top of the cylinders, as is now done by other first-class constructors in this country, and the very first, so far as is known, to fit the car motor with integral cams and cam-shaft, a construction also now used freely by others. Welch Brothers are yet, so far as the writer knows, the only gas engine builders to make a single cam mechanically operate both the intake and exhaust valves of one cylinder. I is now fully proved by practice that gas engine valve stems may be placed at any angl between horizontal and vertical, without injurious effect on the valve and valve sea wear, provided suitable proportions are adopted, and it is still the belief that the best results are obtained by making the compression chamber greatest dimension as small a is consistent with imperative construction requirements. This calls for the nearest practicable approach to the spherical combustion chamber, and up to 1905 the tops of th Welch pistons were cupped to make th chamber approximate the globular form. Thi cupped piston can catch cylinder lubricatin oil, and because of this the pistons wer changed from concave to slightly crowne tops for 1905, and this form will be retaine in the 1906 Welch pistons. The 1905 casin for the cam-shaft bevel gears is retained i 1906, having shown no objectionable features. The rods now have babbitted bearing on the crank-wrists instead of the bronz boxes used up to 1905. All the steel used i the Welch car shafts is imported, the foreign material having the greater strength, i is claimed.

The Welch cars will continue to use plai bearings only. Carefully conducted test made in the Welch laboratory show only ver small power losses due to the use of plai bearings, and it is not regarded by the Welc brothers as sound engineering practice to introduce some hundreds of additional costl and delicate pieces to save a very sma amount of fuel.

Without question, reliability is the first an principal of motor car requirements. A ca ay be silent, may be easy riding and easily ndled, and may be high-powered and show large mileage to the gallon of gasoline conmed, but all this does not make the car tisfactory to its owner and user if the reir bills are large and constant, and there e many days in the season when the car is the shop instead of on the road when the ner desires to use it. Ball bearings, when their best, are fine things, but they are licate, and the breakage of a single ball y put a car out of service for days and tail a repair bill too large to be agreele.

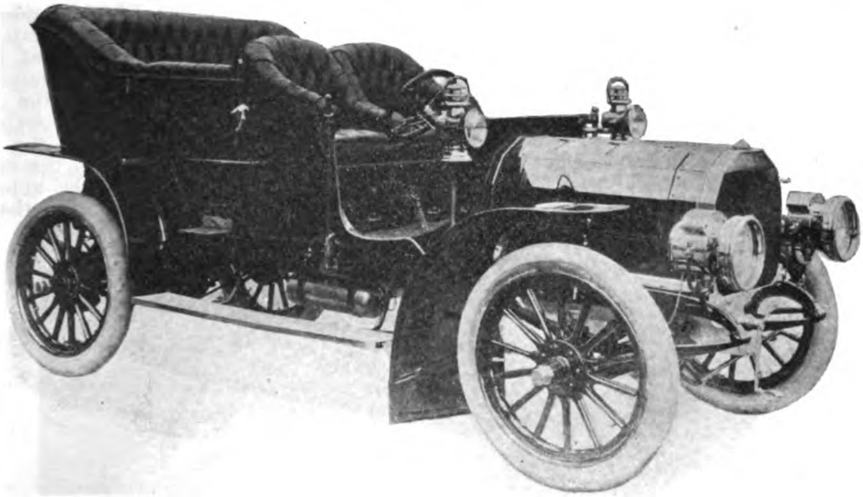


Fig. 2. Welch 7-passenger motor car; weight 3225 lbs., to which the Welch limousine top may be applied, producing the car body shown in Fig. 1.

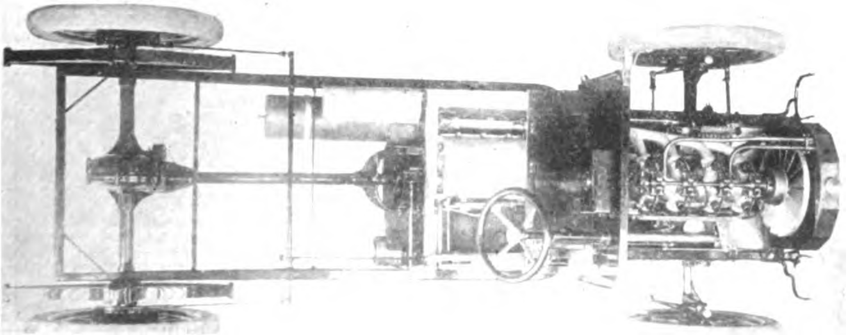


Fig. 3. Welch chassis plan. The rear full elliptic springs are outside, front springs under the narrowed sides. The O G side frame bends are strongly reinforced by flat bars bolted to the bronze engine base lugs forward and to the gear box cross girts in the rear. Principal chassis frame dimensions, 145 in. long by 38 in. wide in rear and 28 in. wide in front. The wheel base is 118 in., but this does not increase the total car length, and the wide sweep of the front wheels makes the car turn in a small circle.

The Welch Brothers say that when the car s ample motive power the ball bearing is t only a needless and costly menace to reability, but that it does not in reality add the slightest degree to the comfort nor easure of the car user, and is always the eakest and most uncertain member of the hole propulsion assemblage, and that well finished and well lubricated plain bearings are better in every way. Believing the plain bearing really the best, these well known makers of fine and costly cars will continue to use only plain bearings for the season of 1906.

The Welch 7-passenger motor car has the following specifications: Wheel base 118 in., gauge 56½ in., wheels 36x4½ in., motor 4-cylinders, 4⅝x5 in., 50 H. P. maximum, water-cooled, friction gear-change selection, silent engagement; body a 7-passenger open tonneau, side entrance, doors swinging to rear, adapted to take Welch Brothers patented attachment, which converts this large 7-passenger open tonneau into an elegantly appointed Limousine body; weight, open tonneau, 3225 lbs.; with the Limousine top the weight is 3500 lbs.; a heater keeps the enclosed part of the body at any desired temperature and there are electric lights inside.

The Welch 5-passenger car, body of which was not quite completed at time of writing, November 24, has the same chassis as the 7-passenger car in every particular. The body is a side entrance tonneau, latest "straight line" design, doors swinging to front; weight about 3000 lbs.

CHASSIS FRAME.

This is of pressed steel, channel section, 4½ in. greatest depth, curved ends, which take drop forged spring eyes. The chassis frame is 145 in. long, 38 in. wide in rear of front board and 28 in. wide forward, giving wheel room for a short turn.

The bronze engine base has lugs reaching across to the chassis frame sides, and the change gear box is carried under two pressed steel cross-girts.

Straight flat steel bars are bolted to the under sides of the crank-box lugs, and are fixed to the front and rear gear-box cross-girts, so as to strongly reinforce the O G bends in the side frames.

THE ENGINE.

The 4 cylinders are 4⅝x5 in. The compression is 95 lbs., and the cylinders are water-cooled. As this engine was previously described at some length it is only necessary to note that Welch cylinders are now finished by grinding with a high-speed emery wheel flooded with water, instead of by lapping as formerly.

The pistons are ground in the grinding machine, five-thousandths below cylinder diameter at the open end and nine-thousandths below cylinder diameter at the head end.

The rod end boxes are scraped to fit, as the crank-shaft boxes. The lubrication is splash pits, supplied by "Precision" o feeds.

RADIATION.

The radiator is an assemblage of hexa tubes hav'ng expanded hexagon ends, pi together and united by soft soldering, a small water chambers are made at the and bottom of the radiator, the water cir lating pump being placed in the mid of the radiator, with horizontal water p sages formed in the middle of the asse blage of hexagon tubes, so that the centri gal pump takes water from the upper p of the radiator and delivers it to the lov part.

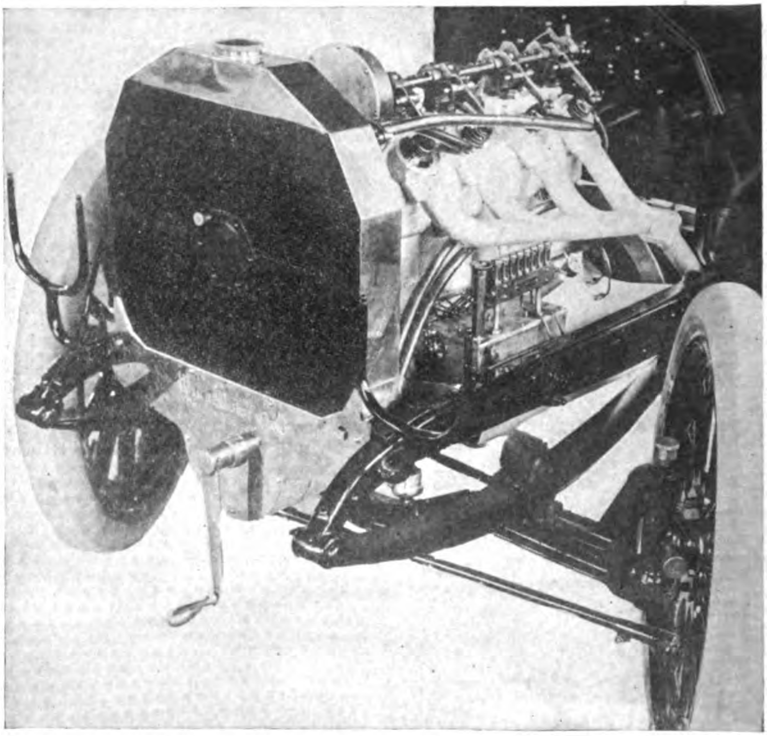


Fig. 4. Welch chassis, front oblique, showing radiator, front spring axle fork and Hill Precision oiler, which supplies lubrication for all driven parts. The water circulating centrifugal pump is placed in the middle of the radiator, access by removing the front plate.

The water piping is of copper, no rub hose, and is water tight and easily connec and disconnected. The circulation is natu bottom of radiator to bottoms of wa jackets, and tops of water-jackets to top of radiator tubes, under a partial floor the top radiator water chamber, so that por from the jackets is sure to be fully c densed before it can rise and enter the water chamber. By this means all loss water by evaporation is obviated, and as copper piping is water tight, water rene is seldom required.

The pump circulation is the same in di tion as the thermal circulation, so that two work in harmony, though the pump always driven when the motor runs. The fan is 18 in. dia., 20 vanes, and has a common axis with that of the pump, both pump and fan being driven by the same 1¼ inch wide rawhide belt.

BODIES AND LOCKERS.

The detachable Limousine top, made under the Welch patents only, provides two styles of car of the highest and most luxurious type in one car, which may be either an open tonneau or a Limousine, seating 7 passengers in either form, as preferred.

For long tours the 5-passenger tonneau with cape top, is lighter and faster, and is the more suitable. The finish and appointments of the 5-passenger car are in every way equal to the 7-passenger vehicles. The weight is considerably below that of the 7-passenger, the cost is a little less, and the speed is greater. All forms of Welch car bodies have a very complete system of lockers and tool compartments for spare tires, batteries and small luggage generally.

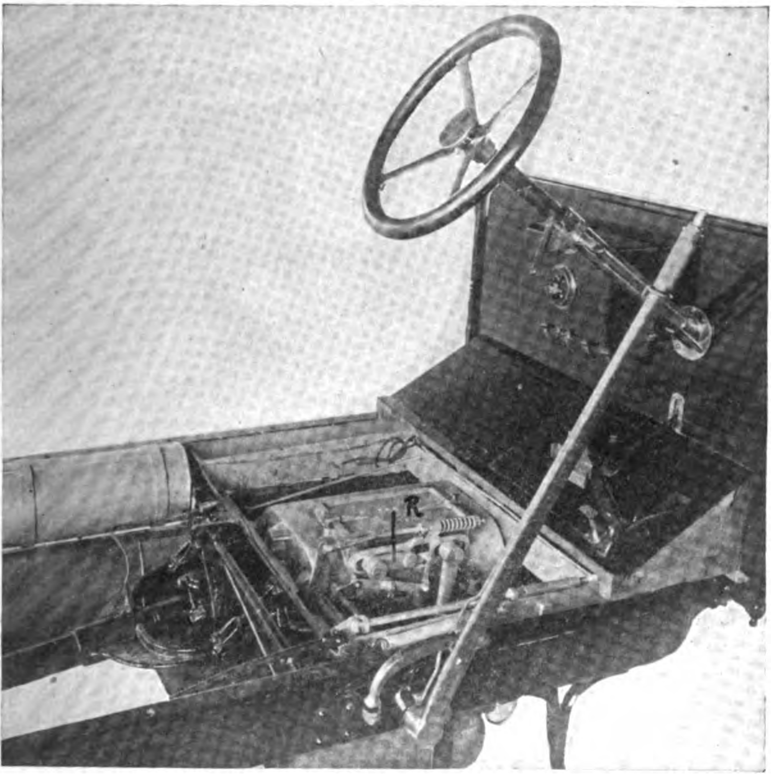


Fig. 5. Welch chassis, middle part, right side oblique, looking to front, showing the control. The single hand lever has only two extreme positions, is not rocked sidewise nor moved up nor down, and gives four effects; the cylindrical grip has a short up and down movement, which works a switch-point in the gear linkage, through a long rod carried down close inside the lever to a horizontal rocker linked to the switch-point, the whole of this grip action operating to work the clutch rocker arm R, either up or down from neutral horizontal position of the R shown in the illustration, by the lever movement, according to the up or down position of the grip. When pushed to extreme front, as in the illustration, the hand lever cuts out all the gears, leaving them standing still, and drives the bevel pinion directly at the crank-shaft speed.

Batteries, spark coils and tires are fitted at option of purchaser, and if time enough is given colors of bodies and trimmings will also be as selected.

CONTROL.

The Welch steering wheel is as before on a telescoping shaft, the wheel pushing down and forward so as to be out of the way of entrance to the driver's seat. Hand wheel position adjustment retention knob on top of wheel.

The spark and throttle control are by two horizontally moving hand levers pivoted on a double ratchet quadrant fixed to the top of the steering shaft stationary supporting sleeve.

The rear hub brakes are applied by a large pedal, ratchet retained and foot released.

The gear change is made by an outside hand lever having a sliding grip, also previously described. When this lever is moved one way it engages the high gear, in which none of the change gears are driven. Moved the other way, grip down, the hand lever engages the low speed gear, or with the grip raised, movement of the lever in the second direction first engages the reverse, and then continued movement of the lever in the same direction applies the powerful emergency brake on the line shaft in front of the front universal joint fork.

An interlocking linkage between the hand lever and the clutch forks permits the high gear engagement to be made at any time, but prevents imparting motion to the low and reverse gears before the low speed clutch or reversing clutch engagement is made. As the drive is through multiple disk friction clutches all speed changes are made without shock or noise. The multiple disk high speed engagement is powerful and permits a slipping drive for running at low speeds on the high gear in crowded streets.

The rear hub brakes, pedal applied, have ample power for all ordinary service, and the emergency brake is seldom required.

The whole Welch control is extremely simple and substantial, and the car has enough power to be driven on the high gear most of the time, with no change gearing in motion.

The Welch was first to place the multiple disk clutch in a motor car, and the merits of this form of friction engagement are shown by numerous followers of Welch practice in this particular.

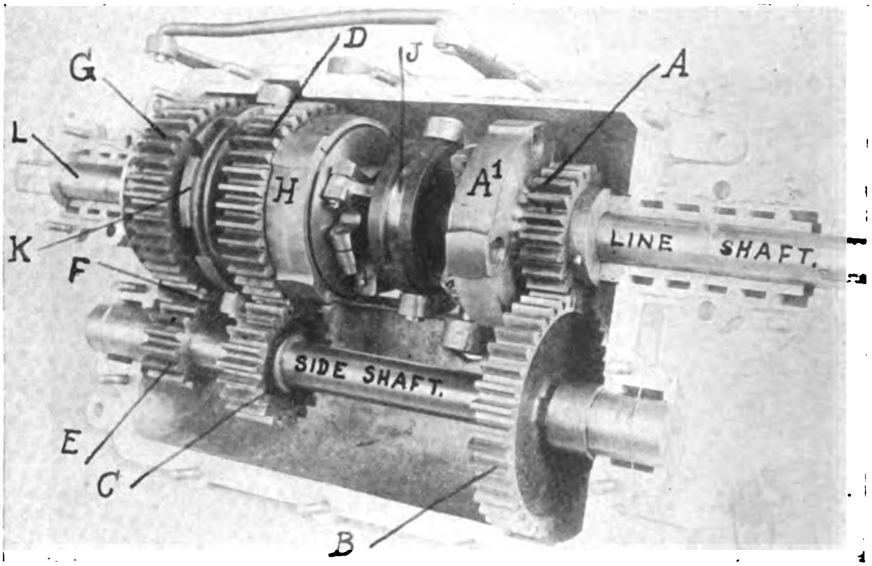


Fig. 6. Welch change gear. The change gear box is of aluminum; this illustration shows the gearing laid in the cover, not in the casing base. The line shaft is driven directly from and with the crank-shaft through an Oldham coupling, and is reduced in diameter and carried through into L, bored to take it, to form a long steadiment. The line shaft is made hexagon at the right place to take the multiple disk clutch members which drive H and A1, and between the clutch disk assemblages the "collecting cone," is placed, which is grooved to take the clutch fork; this "collecting" internal double cone J, which is splined to the line shaft and always turns with it. The pinions E and C and the gear B are all fixed to the side-shaft and turn with it. A and A1 are integral and are free on the line shaft. J is splined to slide on the line-shaft and has double internal cones to work the disk clutch engaging bell-cranks which make line-shaft drive either A1 or H. The clutch disks engaging A1 and H have hexagon eyes sliding on the line shaft hexagon. D is free on L. K is splined to L, to slide but not turn. G is free on L. L is squared at its left end to take the emergency brake drum and front fork of the universal joint. F is an intermediate pinion, barely visible, always in mesh with E and G, and is the reversing pinion. The effects are: (a) With J in neutral mid-position, the motor runs free, turning nothing but the line-shaft, all gears standing still. (b) With the "collecting" cone J at the left the clutch shell H is engaged connecting the line shaft and shaft L, forming either a slipping drive, or a positive engagement turning the line shaft and L even turns with each other at the option of the driver. This is the direct drive, all gears standing still. (c)) With J at right extreme A1 and A, B, C, D, E and G, all the gears, are engaged with each other and turn together, without turning L, if K is in neutral mid position. But, (d) before A1 can engage A, the clutch K must be engaged with either D or G. (e) If K engages D the car is driven on the slow speed. (f) If K engages G the car is reversed. J can be moved to left and effect the high speed engagement at any time. Before J can engage A1, K must be engaged with either D or G. See Fig. 7.

NOTABLE FEATURES.

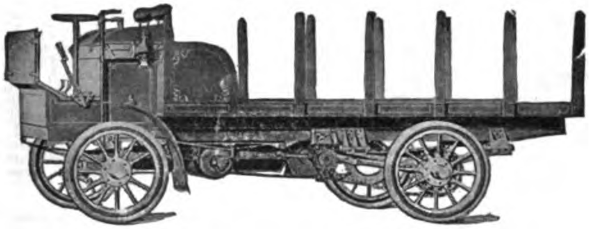
Welch Brothers, in designing their cars, have placed reliability before any and all other considerations, their theory being that the first requirement of a car is that it shall at all times and constantly be ready to go on the road; second place is given to certainty of handling and control; the car must be ready to use when the owner wants it, and must respond to his desires when on the road.

It would seem that these two qualifications of reliability and docile responsiveness were elementary, and that they must therefore control the detail selections and rejections all car designers.

The desire for reliability leads the Wel designers to reject ball bearings, and alumi um castings, the former wholly, and the la ter to such an extent that aluminum appea in a principal member only in the gear b and its cover. In the places where aluminu is commonly used Welch uses bronze, and place of American steel for shafting, i ported chrome nickel steel is employed, e cept in the rear axles, which are of import nickel steel.

Instead of the sliding gear, which may named as the prevailing high class spee change in American 1906 cars, Welch e ploys a multiple-disk friction engagement the selected gear, and uses only two forwa speeds and a reverse instead of three or fo forward speeds, as seen in most 1906 ca As to more than two forward speeds, a thi gear change could be added to the Wel arrangement at small cost, and it is not t expense that stands in the way, but the co viction that more gear changes are of benefit whatever where the car is driven a motor of ample power and flexible contr As to the friction engagement, any change gear can be made without danger of inju by an unskilled driver.

COLD AIR FACTS
ABOUT
Knox Waterless Gasoline Three Ton Trucks



Actual contest between Air Cooled and Water Cooled Motors
AUTO TRUCKS IN TUG OF WAR

FIRST EVENT OF ITS KIND EVER HELD IN THIS COUNTRY.

Knox and Atlas Machines Hold Struggle for Supremacy in Vernon Street, and the Former Carries off the Honors of the Day.

A large crowd of interested spectators yesterday morning saw in Vernon Street one of the most remarkable tug-of-wars ever pulled off in this city, and as far as can be learned the first of its kind ever held in this country. It was a contest between two auto trucks, one of them a 20-horsepower Knox and the other a 24-horsepower Atlas. Fully 200 people saw the contest, among whom were the directors of the National Folding Box and Paper Company, before whom Driver A. E. Dennison was to have demonstrated the Knox truck. Dennison had taken the Knox truck to Vernon Street, and was waiting to demonstrate the car when a driver in an Atlas machine truck came along. He at once took it upon himself to challenge Dennison for a tug-of-war. At first Dennison refused to consider the proposition, but finally after he had been jibed by the Atlas driver and friends he agreed to have the tug-of-war for $100 a side. This was not satisfactory, however, so Dennison agreed to carry out the suggestion free from this stipulation. An inch rope was attached to the rear of each truck, and then at the signal both drivers threw on their power. As soon as the rope became taut it snapped in two under the strain. Two more ropes were obtained and the trucks once more harnessed together. This time the driver of the Atlas got the jump on his opponent, but Dennison threw on his power, and with the engines of the Atlas going at full speed the Knox drew the Atlas truck backward for thirty-five yards, when the Atlas driver shouted "Enough!" There are a number of interesting features outside of the novelty of the tug-of-war. The Atlas car has a water-cooled motor and weighs about 600 pounds more than the Knox, while the latter is fitted with an air-cooled motor. The Atlas cylinder has moreover a six-inch bore and the Knox an inch less. It is estimated that the Knox motor drew about twenty-five tons in all during the tug-of-war. During the struggle the tires of the Atlas car were smoking from the friction, and the macadamized roadway still bears the marks where the machine was pulled backward. The event has caused a great deal of interest among local automobile owners, and the question of having auto tug-of-wars as events is being talked of.—The New Haven Register, November 17, 1905.

Proof positive that we have **strength, power and reliability.**

Capacity, 6,000 lbs. Speed, ten miles per hour.

Chassis is adapted to bodies of various styles.

Don't fail to inspect our exhibit at the New York Show, Madison Square Garden, January 13th to 20th.

Agents in All Principal Cities

KNOX AUTOMOBILE CO.
SPRINGFIELD, MASS.

Largest and Oldest Manufacturers Gasoline Commercial Cars **Members A. L. A. M.**

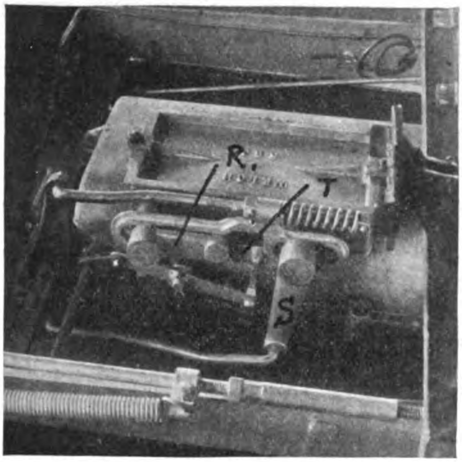


Fig. 7. Right hand side of Welch change gear box in car, showing the linkage operates the clutches J and K, Fig. 20, which see. R works K, and S works J, Fig. 20, R moves upward to engage D, and downward to engage G. S moves to left to engage H, and to right to engage A1 and A. S can move to the left, high speed engagement, at any time, but before S can move to right the switch block T must be moved up or down, which causes K to engage either D or G. Fig. 6.

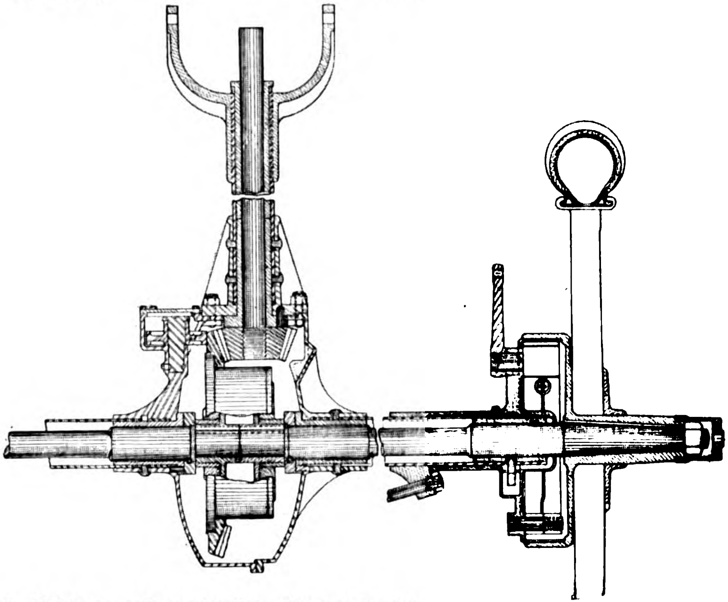


Fig. 9. Welch rear axle construction. The gear housings are steel castings bored and forced in shellac varnish on the finished ends of the 2¾ dia. steel tube axle sleeves, retained by hot rivets driven in against an arbor. The shellac is used merely to make the joint perfectly oil tight. The propeller shaft fork is a steel casting, hinged to the chassis frame cross-girt in line with the single universal joint. The brake-drum, internal, 12 in. dia. by 2¼ in. face takes a free ring of fibre, the hinged internal shoes are worked by a cam-ended rock-shaft. The propeller shaft, 1½ in. dia., is of chrome nickel steel. The gear housing parts join in the middle and are bolted together oil tight. The entire system shown in this illustration is lubricated by a Hill Precision oiler lead, oil entering at the inside of the propeller fork, and descending by gravity to its exit from the rear axle bearings. The whole axle is braced by an underneath tension. The spur balance gears are all cut from chrome nickle steel blanks.

The Welch designers have the courage of their convictions, and steadily refuse to add complications which obtain no real advantages, and a multiplicity of forward speeds, magneto ignition and governor control do not appear in the 1906 Welch, strong as are the claims made by others in favor of these features.

As to more than two forward speeds it may be said here that no 1905 user of a Welch car has asked for more than two forward speeds in placing his order for a 1906 car much less expressed a preference for a sliding gear in place of friction selection.

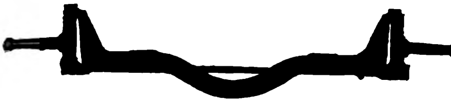


Fig. 8. Welch front axle. The work imposed on the car front axle is very heavy, and tries all built-up constructions severely, and failure of the front axle is common, and is also disastrous, as it always occurs at high speed. The Welch front axle is an integral I-section steel drop forging, which is the limit in points of strength, fewness of parts and reliability, and is also the most costly construction. This axle requires very large dies, very expensive, and takes seven operations, all in very large "hammers," together with heating furnaces, and all this plant with men to work it can produce only five of these one-piece drop forged front axles per day.

The 1906 Welch Limousine is not only electric lighted, but a portion of the exhaust is taken through a controlling valve to a heater, and perfectly warms the car. Electric lighting of the body is not uncommon in high class cars, but the 1906 Welch is the first, so far as known, to make provision for warming.

The patented Limousine top gives the Welch purchaser the advantages of the two most desirable forms of elegant car bodies, the 7-passenger open tonneau and the Limousine, the change being made in less than ten minutes by two skilled men, and in about twenty minutes by those less familiar with the operation.

THE FRONT AXLE.

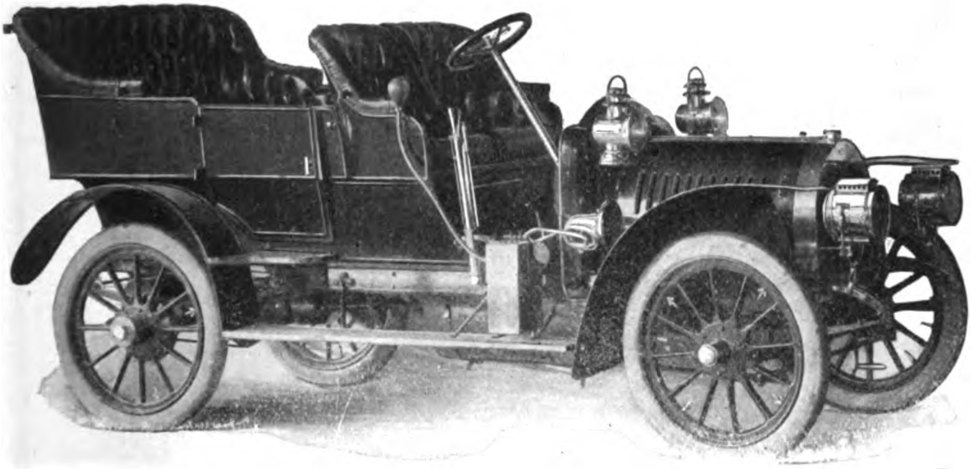
This is a solid steel I-section drop-forging, forks integral, 3 in. deep by 2 in. wide. The knuckle hubs are 8 in. long, the pins are 1 in. dia., machine steel, soft, in soft bearings, no bushes, and no anti-friction device what-

THE 1906 MODEL B

Rainier

"The Pullman of Automobiles"

Absolutely the highest grade motor car built in this country, bar none, and the only car that can consistently compete with foreign machines. You will do yourself an injustice if you decide on your car without investigating this triumphant American production. New style make and break spark. Simms-Bosch Magneto, Bevel Gear Drive. Very large and roomy full aluminum bodies.



Model B Rainier, 30-35 H. P. Price, $4,000

Guaranteed Free of Repairs for One Year

Do you realize fully the great superiority of the "make and break" over the jump spark?

Do you know that it does away entirely with the coil, the commutator, the batteries, and the spark plugs, and substitutes for all these a simple hammer and anvil, mechanically operated, which cannot get out of order?

Do you know that 90 per cent. of the foreign makers have already adopted this method?

Do you know that the RAINIER car is guaranteed not to cost one dollar for repairs within one year of purchase, unless you have an accident, and that it stands alone in this respect?

Learn all about it in our new Bulletin just issued.

THE RAINIER COMPANY, Broadway, Cor. 50th Street, New York

Boston Agents: MORRISON-TYLER MOTOR CO.

Good Agents wanted in unassigned territory.

ever. This construction is extremely simple, and neither front nor rear axles have failed in any way nor given the slightest trouble in 1905. No Welch rear axle ever caused delay, and since the drop forged front axles have been fitted, that, also, has given entire satisfaction.

SPRINGS.

These are full elliptics in the rear, 45 in. long by 2¼ in. wide, 8 leaves, fixed to the chassis frame on top.

The half-elliptic front springs are 40 in. long, 2¼ in. wide, 8 leaves, jointed to the drop forging forward eye, and shackled at the rear, and are perched 4 in. short in fron

DRIVING WHEELS.

The divided rear axles are increased to 1 in. dia., plain bronze bearings, non-adjusta ble, wheels applied to the shaft ends directl taper, key and nut retention. The bevel gea is 4, d. p., 48 to 51 teeth, according to reduc tion, 1⅞ in. face, the small bevel pinion hav ing 17 teeth. The large gear is supporte by a roller opposite the pinion, and the gear and pinions are hardened.

No struts are used, the propeller shaft fork hinged in axial coincidence with the singl universal joint, taking the place of struts.

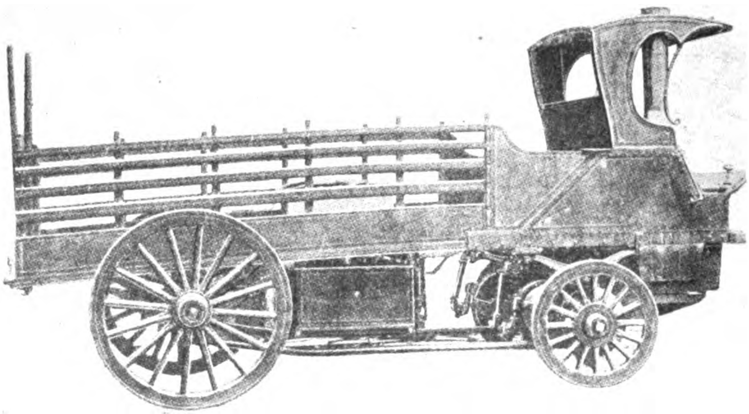
Halsey Steam Truck

A new steam truck has lately been put on the market by Jas. T. Halsey Motor Truck Co., 336, 338 N. York Ave., Philadelphia, Pa., after the designs of Jas. T. Halsey. This truck, which has a loading platform 16 feet long by 5½ feet wide with a carrying capacity of 8 tons, uses coal for fuel under its boiler.

The boiler is of the water tube type, so designed that it fits the lines of that portion of the vehicle which it occupies, and is capable of carrying a large body of water, as a consequence of which steam may be supplied to the engines in sufficient quantity to give great torque and enable them to accelerate quickly. The fire box and the grate area are large enough to accommodate sufficient coal, pea grade, in one charge, working under slow combustion, for one-half day's run, equal to 30 miles, without the necessity of stoking during the entire run. About 500 pounds of coal is required for a day's work under full load.

The generator delivers steam to a superheater, which raises the temperature of the steam to 1000 degrees F. before it delivers to the motors. The engines are of the multi-cylinder type, nominally of 30 horse-power each. These have been on the market for a number of years, in many cases doing good service without stoppage for months at time. Their normal speed is 1000 revolution per minute, with a piston speed of 500 fee per minute, which corresponds to a speed o 10 miles per hour for the truck. These engine require no adjustment or attention other tha filling the oil cups. As there are no stuffing boxes superheated steam is used withou detriment to the machine. The economy i the use of steam in these engines is the sam as in any well designed reciprocating engin under similar conditions.

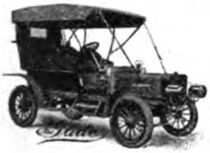
The motors are coupled directly to each o the front wheels by spur gearing. They ar designed as a unit and can be replaced in few moments in event of any accident. Th water tank is suspended from the body of th truck and, carrying 1500 pounds, is of sufficient capacity for a 15 or 20 mile run, depending, of course, upon the condition of th roads.

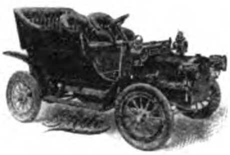


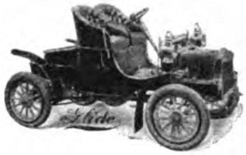
Halsey Steam Truck.

The truck shown in the illustration has length over all of 20 feet, with a wheel bas of 10½ feet and 6½ feet gauge. The forwar wheels are 42 inches and the rear wheels ar 60 inches in diameter, the tires being of th ordinary steel type. It will be noted that th greatest part of the load is carried on the rea wheels, which, being large, make easy trail ers. The body of the truck is very flexibl yielding readily to any irregularity in th roadbed.

The Glide







Three Glide Models for 1906

Model C Glideabout, single cylinder, 8-11 H. P.,	$ 800.00
Model F Glide, 16-18 H. P., double opposed,	1250.00
Model E Glide, 30-35 H. P., four cylinder,	3000.00

All swift, smooth, good-running cars that travel everywhere.

Catch the Glide idea.

To Glide, not simply ride, is the 1906 way to go.

Moving off from a standstill so smooth and easy you hardly know you are going until you reach full speed. Running smoothly and silently without jar and slowing down until you hardly know when you stop; that is gliding. It makes the Glide much talked about and salable everywhere. It is free from freaks and has no untried notions. The basis of its success is that it goes over the road and gives satisfaction.

Our representatives are out, and will call upon you if you desire to see them. We also extend to you an invitation to visit our factory, or call to see us at the New York Automobile Show, 69th Regiment Armory, January 13-20, Main floor space, A-4. Or at the Chicago Show in the Coliseum, spaces 91 and 92. Agencies are being closed daily, but we have a few more good ones open for live, hustling and responsible dealers. Better write to-day, and have us reserve territory for you until we can get together. Our proposition means a good line, prompt shipment, right prices, liberal commission, good territory, and a great demand for Glides.

Member American Motor Car Manufacturers' Association.

Manufactured by
THE BARTHOLOMEW CO.
PEORIA, ILL.

The Glide

The New Addition to the Glide Factory. Now in Full Operation. Fully Equipped—Well Arranged. A Model Plant for the Production of these Popular Cars. The North Building.

Lest you doubt our facilities, we call your attention to the fact that our equipment is most modern and complete for making every part of an automobile. We consider it poor policy to over-sell. If you do not contract on time, we decline orders. Give us an early contract, and we will deliver the goods to you on time. An agency without something to sell is unprofitable. Our guarantee will protect you against a loss of this kind Our facilities are unexcelled. Our factory is well lighted, is equipped with modern appliances, and we are turning out cars made of the best material and design, and known everywhere to be reliable. Economy, comfort, style and elegance combine to make Glides popular automobiles, with discriminating buyers.

If you afford us an opportunity of demonstrating what we offer, we can show you a thoroughly up-to-date line of automobiles, that are built for hard usage and will work well every day in the year. Our motto is "Maximum service: minimum cost of maintenance."

The South Building, or Original Part of the Glide Factory. Now Equipped with Most Modern Machinery—Each Department a Model in Every Detail. The Busiest Factory in the West.

Manufactured by
THE BARTHOLOMEW CO.
PEORIA, ILL.

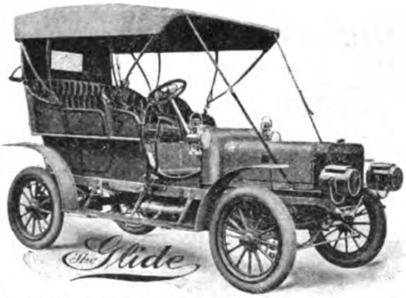
The Glide

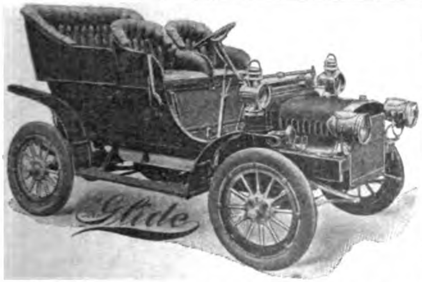
Model E, Glide Touring Car

Price, $3,000, f. o. b. factory, Peoria, Ill.

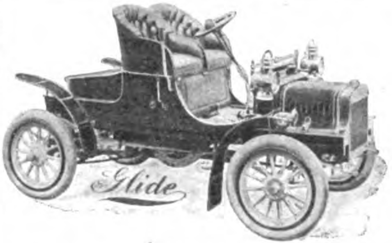
SPECIFICATIONS

BODY—Double side entrance tonneau, with individual front seats.
COLOR—Automobile gray or royal blue; gray and cream running gear.
WHEEL BASE—103 inches.
WHEEL TREAD—Standard.
WHEELS—32 inches, wood, artillery type.
TIRES—32x4 inches. **FRAME**—Pressed steel.
MOTOR—Vertical four-cylinder, in front under hood. 4¼x5 individual cylinders.
HORSE POWER—35.
GASOLINE CAPACITY—18 gallons.
COOLING—Water, cellular radiator with fan.
IGNITION—Jump spark, storage or dry cell batteries.
DRIVE—Bevel gear on rear axle.
TRANSMISSION—Planetary in oil.
STEERING GEAR—Irreversible. **SPEEDS**—Two forward. one reverse, more if required.
LUBRICATION—Positive feed lubricator. **BRAKES**—Emergency on rear wheel hubs; halting on transmission gear. **EQUIPMENT**—2 oil lamps, horn and complete tool kit.





Glide light touring car. Wheel base 80 ins., gauge 54 ins. wheels 28x3 ins., and 30x3½; motor 5x5 pair of opposed cylinders, 4-cycle water-cooled. Body, side entrance tonneau, doors swinging to rear, seats 5 passengers. Weight 1550 lbs. Price $1250.



Glide, 1906, runabout; wheel base 79 ins., gauge 54 ins., wheels 28x3 ins., motor single cylinder, 5x6 ins., 4-cycle water-cooled. Individual front seats for two passengers, and is also fitted with a detachable tonneau, with seats for two passengers additional. Weight of runabout 1100 lbs; price $800, with tonneau, $900.

Manufactured by
THE BARTHOLOMEW CO.
PEORIA, ILL.

The Glide

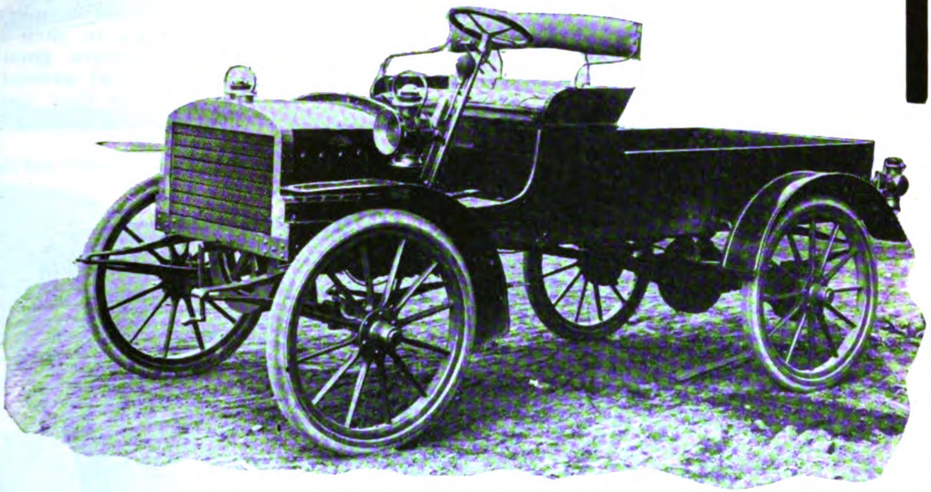
AUTOMOBILE DEALERS

What most of your customers want are either single cylinder runabouts, double opposed motor, medium size touring car, or a four-cylinder large touring car at a moderate price. Our line places you in position to meet all comers, and it is not necessary for you to handle other makes to meet the public demand. It is far more satisfactory and profitable to push one line than to try to talk up the merits of several different makes. It is better to deal with one factory, because your shipments can be bunched into carload lots, reducing freight or express charges. By giving us a contract covering your requirements, we can deliver you the goods as promised. We have wide experience as manufacturers, and have been in the automobile industry for four years. Our different models are perfected and have been thoroughly tested, and they are in position to serve you and your customers faithfully and well.

Don't experiment with new lines. The Glide is a sure thing, and you can back it with your money and reputation, and fear neither competition nor customers. We solicit your correspondence, as we are anxious to give you full details.

Manufactured by
THE BARTHOLOMEW CO.
PEORIA, ILL.

The SOULES DELIVERY WAGON



Price, $1500.00

Lots of power; lots of strength; simplicity of construction and durability. These, together with moderate price are what must be combined to make the ideal delivery car, which is to carry a load not in excess of 1500 pounds.

The Soules Delivery Wagon is equipped with a double opposed engine, with 5 x 5½ in. cylinders, located under the hood. Sliding Gear Transmission, two speeds forward and reverse. Practically all working parts of the machine are directly under the hood, or the floor-boards under the operator's feet, which is the only form of construction suitable for delivery wagons, as it would not be practicable to remove the load in order to make repairs if necessary.

Dealers throughout the country thus far have failed to fully appreciate the desirability of building up the commercial end of the motor car business. The day is not far distant when it will be more satisfactory and profitable than the pleasure vehicle, and the agent who takes hold of this branch of the business early will get his experience in time to reap the reward of a big boom later, besides adding a fair amount to his profits at present. **THE SOULES DELIVERY WAGON** is the only car to-day of a moderate price, which is built for the purpose for which it is intended. It is not a pleasure vehicle chassis with a delivery wagon body, but is built for one purpose—that of carrying a paying load of at least 1500 pounds.

Correspondence Solicited

SOULES MOTOR CAR CO., - GRAND RAPIDS, MICH.

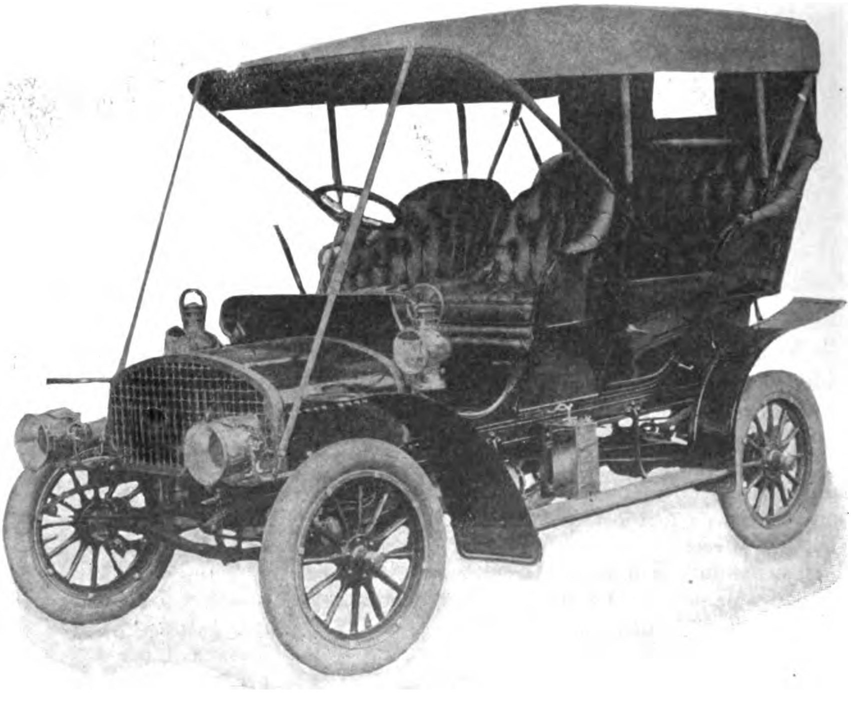
Torbensen Motor Car Co.'s Product for 1906

The Torbensen Motor Car Co., Bloomfield, N. J., was incorporated in March last to take over the automobile end of the business formerly carried on by the Torbensen Gear Incorporated in connection with the manufacture of ignition outfits and other automobile specialties.

During the past four years The Torbensen Co. has built a number of cars which have been disposed of locally, and the company therefore had an excellent opportunity to watch their performance and to make such improvements as might be suggested or found desirable from time to time. They were early led to experiment with the air-cooled motor, and while at first the results were not entirely favorable they recognized the many advantages such a motor, in a practical and dependable form, would have over the water-cooled motor. They continued building them with the result that they are now offering the trade an air-cooled engine and are prepared to guarantee their performance to be as reliable and satisfactory, and in some results more so, than water-cooled motors.

The main difficulty encountered was the lubrication problem. They very early decided that the cooling was secondary in importance, and that a more regular, exact and positive way of lubricating the walls of the cylinders than that afforded by the splash system was a necessity, if the air-cooled motor was to be dependable enough for commercial work, and they set to work to develop first, a lubricator, which should be simple in construction, proof against derangements and automatic, and in the second place, to apply the lubricant in such a way that the whole of the surface of the cylinder traversed by the piston would be kept moist by the oil and yet preventing carbon deposits.

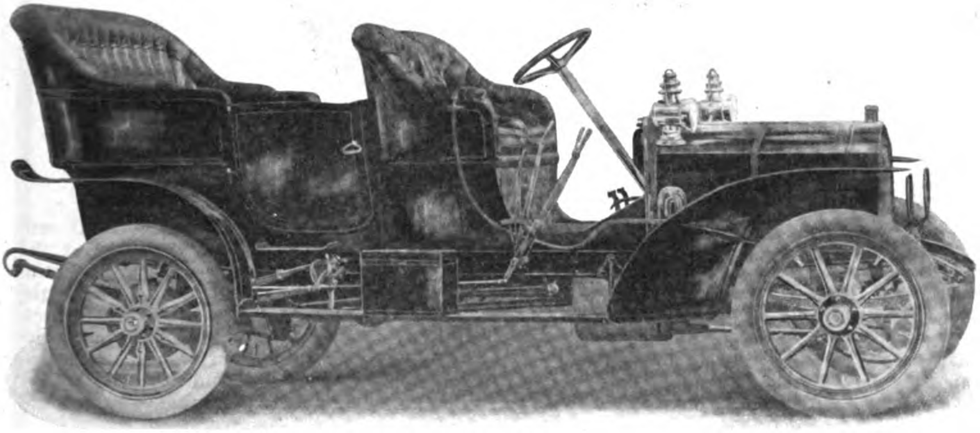
This they accomplished satisfactorily by a force feed pump, which forms part of the engine and is driven by gear from the secondary shaft. The oil is delivered by measured and predetermined quantities to each cylinder, and is forced by pressure from the plunger pump in between and around the piston and cylinder walls, so that there is always a thin film of lubricant keeping them apart.



Touring car built on the Torbensen 6-cylinder air-cooled chassis.

The company builds a 3-cylinder air-cooled engine for commercial work, and 6-cylinder air-cooled engines for pleasure vehicles, and having thoroughly tested their product by actual service in the hands of others, as well as themselves, they now offer these motors and their transmission gears to the trade. They have recently purchased a factory in Bloomfield, where they will have every facility to produce them.

The new factory is located at No. 610 Bloomfield avenue, and consists of a brick building 50x60 and a frame building 30x75, with plenty of ground for additional buildings.

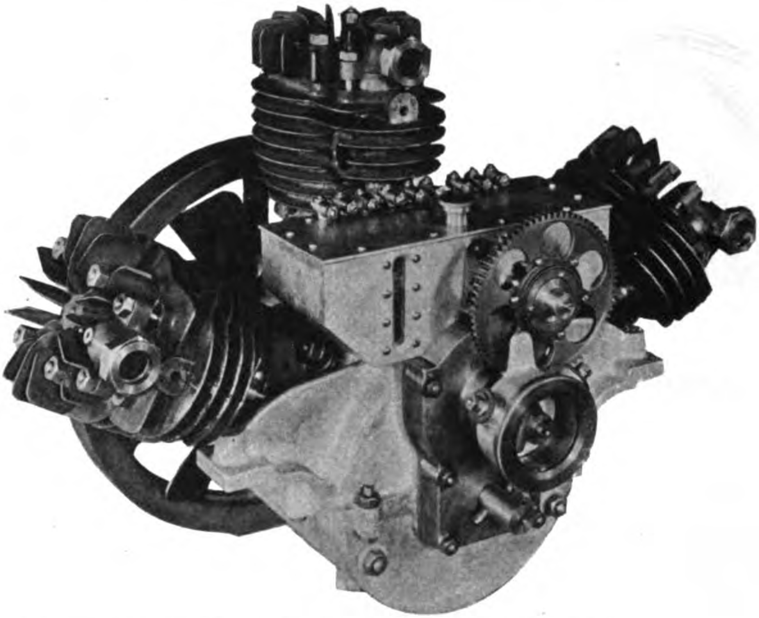


The man who visits the Packard plant sees every modern mechanical device that is applicable; sees a thousand minds concentrated on a single type of car; feels the Packard spirit of perfection; then knows why the Packard stands in a class by itself.

Packard Motor Car Co., Dept. 11
Detroit, Mich.

Member Association
Licensed Automobile Manufacturers

New York Branch
1540 Broadway



Torbensen 3-cylinder air-cooled engine—center cylinder vertical and those at each side are inclined at a 60 degree angle and placed forward of the vertical cylinder.

Their 3-cylinder engine, as will be noted, has the cylinders spaced, one vertical and two at an angle each of 60 degrees from the perpendicular, the two inclined cylinders are placed forward of the perpendicular one, and are connected to the same crank, the perpendicular cylinder to a crank 180 degrees, or opposite to the others; this gives evenly spaced power impulses 240 degrees apart, and a very steady application of power. It will also be readily seen that the spacing of the cylinders in this manner gives maximum natural cooling effect and minimum weight and space occupied, and as a matter of fact, this 3-cylinder motor weighs less than the usual 3-cylinder upright of same power, and takes up less space fore and aft. The valve mechanism is simpler, the exhaust valves are

Truck built on Torbensen 3-cylinder air-cooled chassis.

A NEW GASOLENE TRUCK

OF

THREE TONS CAPACITY

WILL BE EXHIBITED BY

THE COMMERCIAL MOTOR CAR CO.

AT THE

ARMORY SHOW

26th Street and Lexington Ave., New York.

SPECIAL FEATURES

Ample strength of all parts.

Simple and effective method of control.

Liberal motive power. 30 H. P. 4 cylinder engine

Novel three speed and reverse transmission. Gears always in mesh.

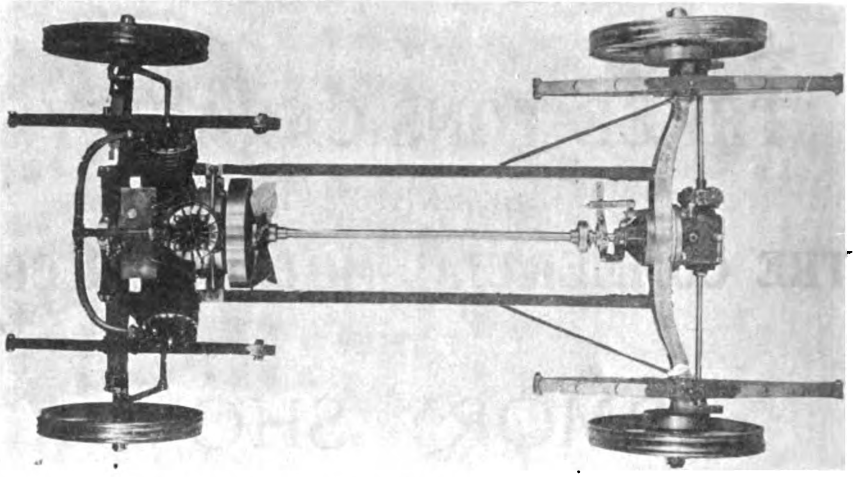
Durable non-skidding tires. Easily and inexpensively repaired.

SEND FOR CIRCULAR

THE COMMERCIAL MOTOR CAR CO.

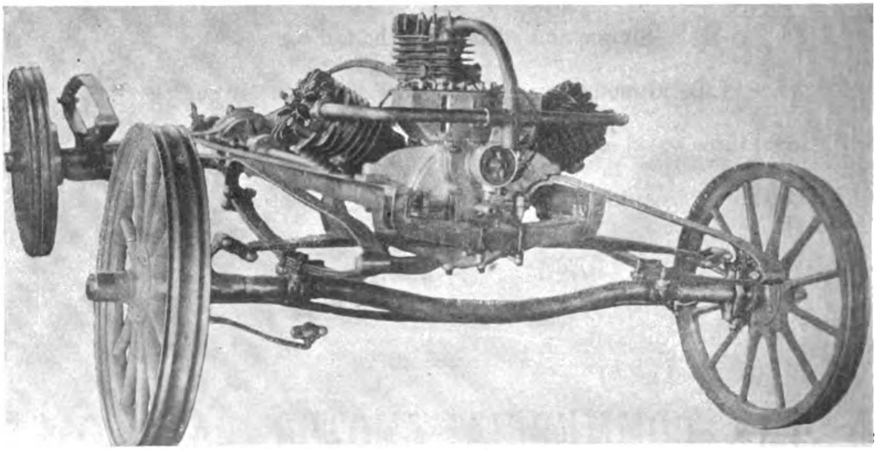
4 East 42d Street
New York, N. Y.

all operated by a one-piece cam enclosed in the crank case, and the inlet valves are automatic. The ignition is by jump spark, the plugs being placed in the middle of the cylinder heads. All the bearings of the crankshaft are hard phosphor bronze of ample size and they are lubricated in the same positive manner as the cylinders, through internal channels direct to the bearings.



Plan view of the Torbensen 3-cylinder air-cooled chassis.

It should be said that the cooling flanges of the cylinders are deep and thin, spaced about 9-16 in. apart. When the car is running on the level at a reasonable speed the natural draft is quite sufficient to keep the motor temperature down, but when climbing hills or working on the low gear the suction fan back of the flywheel helps to exhaust the heated air from around the cylinders, thus keeping the temperature within safe working limits.



Front view of the Torbensen complete chassis with 3-cylinder air-cooled engine.

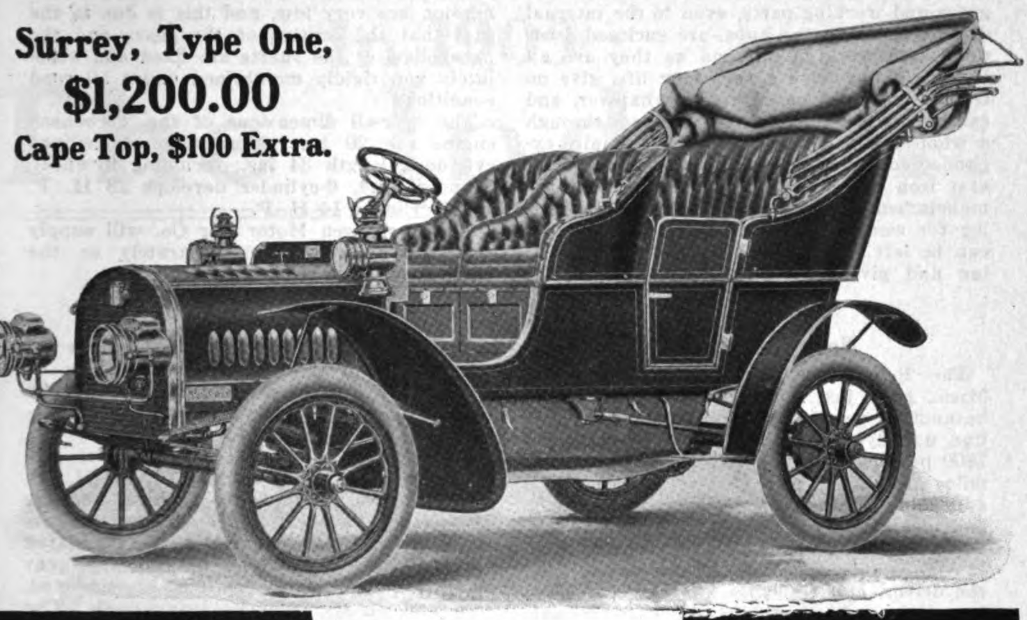
The 6-cylinder motor might be said to consist of a pair of 3-cylinder motors, mounted one behind the other, on the same base, and with a continuous crankshaft composed of a 4-throw crank, as on a 4-cylinder motor, but having six power inpulses instead of four, which, spaced evenly, or 120 degrees apart, gives a continuous application of power to turn the crankshaft and a very smooth and even running engine, approaching in effect the electric motor.

The Torbensen gear and transmission system is already well known. Our illustrations show the company's complete chassis and a truck of 1500 lbs. capacity, built upon this chassis. The Torbensen gear is especially suited to commercial work on account of its extraordinary simplicity and directness. The gear is planetary, with two forward speeds and reverse. All the gears, also the clutch, are contained in the rear axle, which is a one-piece manganese bronze casting with a deep vertical section, strongly ribbed and of extreme stiffness and strength. On this axle is journaled the countershaft in ball and roller bearings, driving the wheels through an

Surrey, Type One,

$1,200.00

Cape Top, $100 Extra.



The Rambler

requires 40 to 50% less gasoline than other cars

110 miles, over three mountain grades, from Los Angeles to Santa Barbara, Calif., on **7 1-2 gallons of gasoline,** is the Rambler record. The three other cars with perfect scores used 9½, 10½ and 12 gallons respectively.

A practical demonstration at any Rambler agency of Rambler ease of control, simplicity and reliability of mechanism, slight cost of fuel and maintenance, will prove to you that the Rambler is the car for you to buy.

Surrey, Type One, illustrated above, complete with lamps, horn, tools, etc., $1,200.00. Cape top $100.00 extra. Write for catalogue illustrating and describing six different models from $650.00 to $3,000.00.

Thos. B. Jeffery & Co.

Main Office and Factory, Kenosha, Wis., U. S. A.

Branches:

Boston, 145 Columbus Ave.; Chicago, 302-304 Wabash Ave.;
Philadelphia, 242 N. Broad St.; New York Agency,
134 W. 38th St.; Milwaukee, 457-459 Broadway.
Agencies in other leading cities.

internal toothed gear fixed to the hub. All gears and working parts, even to the internal driving gears on the hubs, are enclosed dust-proof and work in oil, and as they are all hardened they have a very long life, give no trouble and need no adjusting whatever, and can be left to take care of themselves through a whole season. The clutch is internally expanded, made of cast iron, working against cast iron in a bath of oil. It is what the makers call a compound clutch, self-adjusting for wear, and having ample surface. It can be left to slip indefinitely without sticking and gives extremely easy and smooth starting. The frictional losses in the transmission are very low, and this is due to the fact that the centers of the gears and the parallelism of the shafts are fixed and absolutely and rigidly maintained under all road conditions.

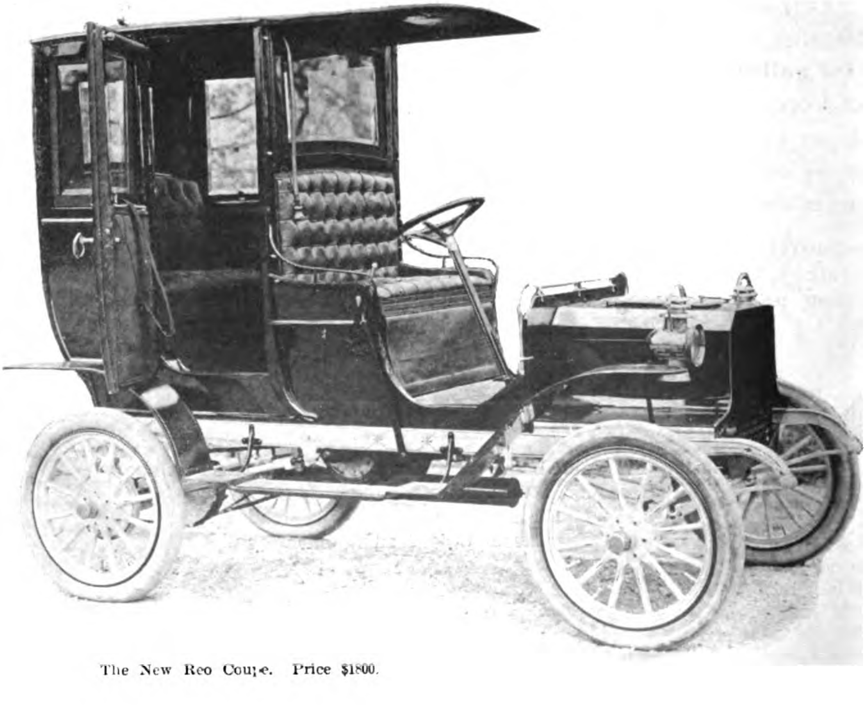
The over-all dimensions of the Torbensen engine are 29 ins. across tops of inclined cylinders, length 34 ins., including flywheel, cylinders 4x4, 6-cylinder develops 28 H. P. and 3-cylinder 14 H. P.

The Torbensen Motor Car Co. will supply their air-cooled engines separately or the complete chassis ready for the body.

New Reo Coupe

The Reo Motor Car Company, Lansing, Mich., have just launched what promises to be another very popular model of their 1906 line, namely—the 16 h. p. Reo Coupe, weight 1800 pounds, with a speed capacity of 30-35 miles per hour; price $1800. This car is admirably designed for calling, theatre going, and making hurried trips to depots and elsewhere in cold, rainy, or stormy weather. It comfortably seats three passengers, besides the driver, and embodies all that is elegant, luxurious and artistic in the carriage-making and upholstering art, as well as combining every appointment and convenience known to the modern coupe. It is completely proctected in winter by a glass front and windows. There is communication with the driver a speaking tube from the rear seats. This back seat accommodates two grown people comfortably. In summer the glass front may be removed, and all the windows let down. This makes the vehicle airy, shady an altogether comfortable. The body is detachable, and the car itself may easily be converted into the regular touring car; it will be on exhibition at all of the leading 1906 automobile shows, and is now ready for delivery.

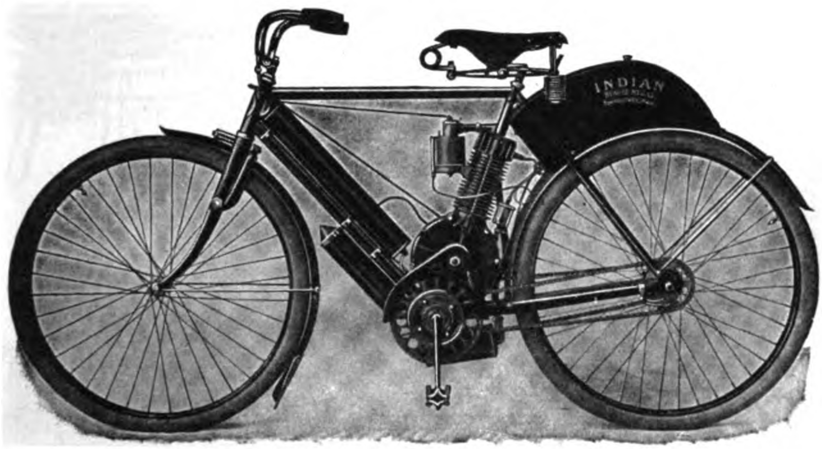
The engine is of the opposed type, two cylinders, 4¾x6 in., giving 16 B. H. P. Valves are all mechanically operated and are protected. The cylinders and water jackets are integral. The cooling water is circulated through a tubular radiator by a positive gear pump. Jump spark ignition is employed, two sets of dry batteries being used. The clutch is of the multiple disc type and a two speed and reverse planetary speed change device without internal gears is used. Drive is by a heavy roller chain. The worm and segment steering device is enclosed and dust proof and is operated by an irreversible wheel The gasoline tank holds 10 gallons, good for 120 to 200 miles running. The water system holds 4 gallons. The wheel base of this car is 90 in.; tread 55 in. Three double acting brakes are provided.



The New Reo Coupe. Price $1800.

In 1905
The Indian

Won



EVERY NATIONAL CHAMPIONSHIP

EVERY HILL CLIMBING CONTEST
Except half of one.

EVERY ECONOMY TEST

THE MILE RECORD

13 Medals in the F. A. M. Endurance Contest

and an overwhelming majority of minor races and other events.

In previous years, its record was as impressive. For instance, in 1903 and '04 won the only gold medals offered in the national endurance contests and also the only old medal awarded motorcycles by the St. Louis Exposition.

LUCK plays no part in such remarkable and long sustained performance in public competitions. The moral is obvious.

HENDEE MFG. CO., SPRINGFIELD
MASS.

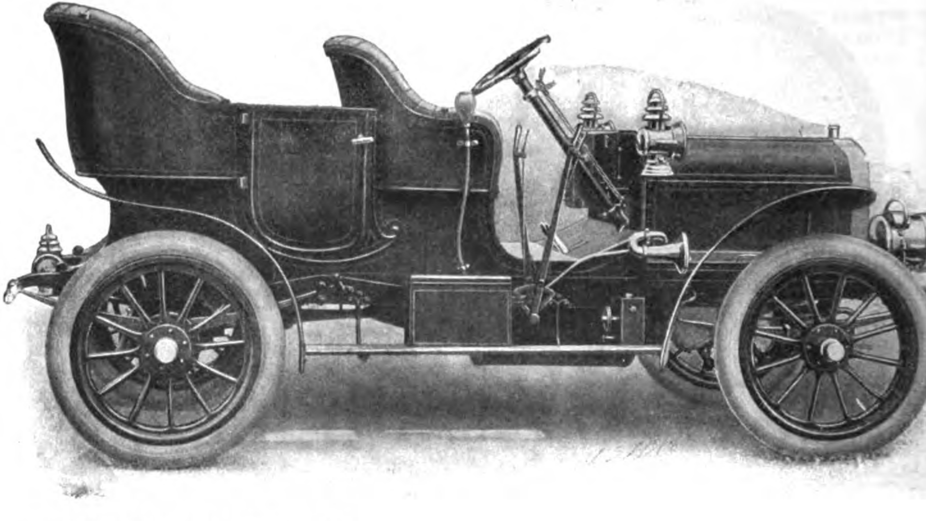
The Gaeth 1906 Cars

W. J. GRUBE

Gaeth Motor Car Co., an independent factory located at 902-906 Pearl Street, Cleveland, O., has three new models ready for 1906 trade.

All have 4-cycle, 4-cylinder vertical water-cooled motors, sliding gear transmission direct shaft drive. All models are built on exactly the same lines and conform with the latest practice. The specifications of the different models are as follows:

Type G, 20-24 H. P.; price $2000; motor 4-cylinder vertical, bore 4¼ in., stroke 4½ in., sliding gear transmission, giving three speeds forward and one reverse with direct drive on third speed, drive direct to bevel gear axle. Frame is angle steel, 2 in. wide, 4 in. deep, tapered at both ends, spring eyes being formed integral with side members. Springs are semi-elliptic, 42 in. long in front, 48 in. long in rear.



Gaeth Model H, 30-34 H. P., 4-cylinder car, cylinders 4¾x5, 3 speeds and reverse, 34x4 in. tires, wheel base 104 in., weight 2600 lbs., price, $2500.

The front axle is tubular, 2 in. dia., wheels fitted with Timken roller bearings, Elliott pattern steering knuckles. Rear axle, Timken bevel gear driven, floating type; wheels 32x3½; tires American or Continental. The rear wheels are fitted with 12 in. dia. internal expanding brakes, and auxiliary brake is located on drive shaft. Holley float feed spray type carburetor is used. The cooling is Thermo-Siphon with Kell's Radiator. Ignition is jump spark with 4 vibrator coils, storage battery and dry batteries both being used, and Herz timer. Lubrication is by Mason Kipp belt driven oiler, feeding oil direct to cylinder. Body is a new and attractive surrey type or King of Belgians, choice optional with purchaser. Wheel base 98 in., tread 56 in., weight 2200, fully equipped.

Type H, price $2500, has a 30-34 H. P. motor, 4-cylinder, vertical, bore 4¾x5 in. stroke; transmission, three speeds and reverse direct on high, ratio on high gear 3 to 1. Frame angle steel, 2 in. wide by 4½ in. deep, tape and curved at both ends; spring eye for integral with side frame members, engine ried on main frame; wheels 34x4 in. T optional, and body, carburetor, lubrication, nition and cooling same as Type G; a same as Type G, but heavier; wheel base in.; weight 2600.

Type J, price $3500, has a 50-54 H. P. tor, 4-cylinder, vertical, water-cooled, Ther siphon system, with auxiliary gear dri pump, and is the only model Gaethmo which uses pump in cooling system. Cy lders are 5¼ in. bore by 6½ in. stroke.

Transmission, sliding gear, giving three ward speeds and one reverse, direct on hi gears are 5 pitch with 1½ in. face; ratio to 1 on direct drive. Drive is by direct sh to bevel gear on rear axle, rear gear and d ing pinion 4 pitch; wheels are 34x4½ in.; ti optional; springs 2 in. wide, 42 in. long front, 48 in. in rear; frame angle steel, in. wide by 5 in. deep; same form as ot models; body same styles as with other m els, but with large and roomy tonneau t will seat four people very comfortably; bra 12 in. internal expanding on rear whe powerful clamp band brake, 2 in. wide drive shaft; axles, front 2¼ in. dia., tubu Elliott type steering yokes; Timken ro bearings in front wheels; rear axle Timk load carried entirely in housing, wheels clu driven; wheel base, 109 in., tread 56 weight 3000.

NOTABLE CHANGES.

The most notable changes in the Gaeth bile for 1906 is that all models have four inder vertical motors and a sliding cha gear is substituted for the planetary transm sion heretofore used. The cooling system also been changed, Mr. Gaeth this year us a Kells tubular cooler, where in the past

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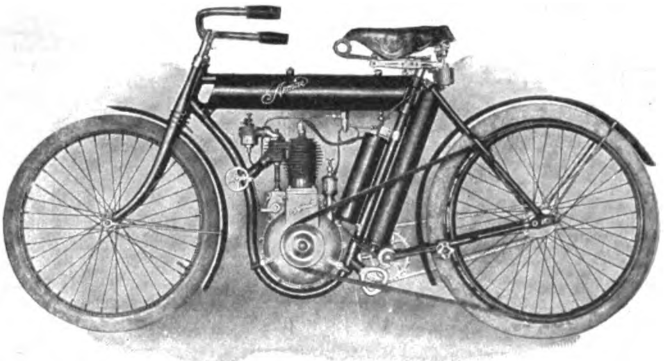

Space will not permit of detail description of the practical, up-to-date improvement of the

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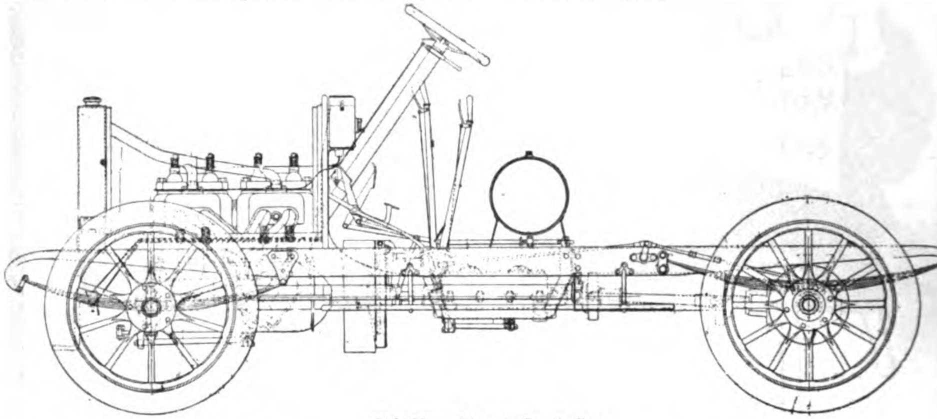
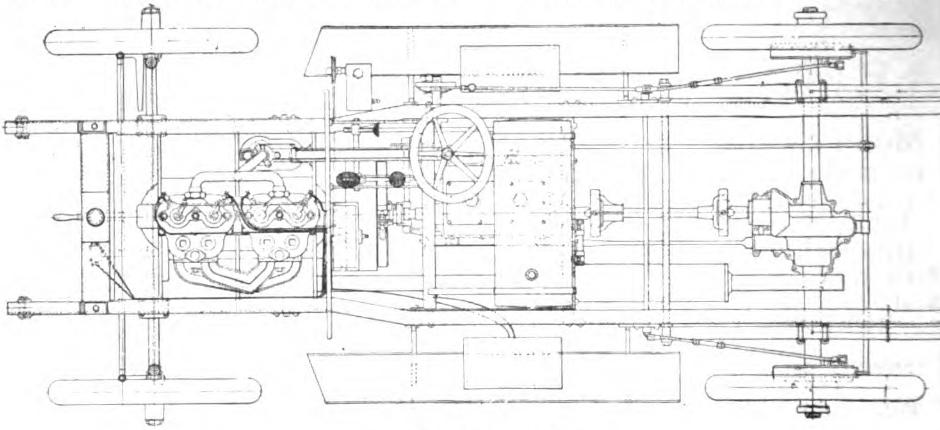
had always made his own radiators. The one feature that remains the same in all Gaethmobiles is the thermo-siphon system of cooling, and with the exception of the 50 H. P., Mr. Gaeth has never resorted to the use of pump, and informed the writer that Mr. Kells is now making for him a radiator from original designs, which will have an auxiliary tank and the necessary cooling surface to eliminate the pump even on the 50 H. P. The motor, as will be noticed from illustrations, is mounted exceedingly low and the radiator high, and the water pipes, which are of cast aluminum, arranged in such a manner as to aid in the natural circulation. As to the efficiency of this system a hard run during which some long and very steep grades were encountered, did not start the water boiling, which perhaps may be accounted for by the fact that on no grade, and some exceeded 20 per cent., was it necessary to change gears, and all hills were taken at a good speed on top gear.



Side View Chassis Gaeth Car.



Plan View 1906 Gaeth Chassis.

THE 30-34 H. P. GAETH ENGINE.

The motor on the 30-34 H. P., and which is shown in the illustrations, has a bore of 4¾ stroke, 5½ in. cylinders, cast in pairs, with heads and water jackets cast integral, cylinder bore ground accurately to size. The exhaust valves, which are mechanically operated, are arranged on left hand side of motor.

The inlet valves, which are automatic, arranged immediately in the centre of cy ders, a special Y-shaped casting, housing inlet valves. This housing is secured three studs and nuts. The spark plugs scr horizontally into these housings. The thr tling of motor is accomplished by throttl carburetor and by a special mechanical vice which limits the lift of the intake valv The two operating levers being linked gether, move simultaneously, allowing motor to run almost noiselessly or wh charge is throttled and gives valve full when throttle is opened. This arrangem not only prevents noise, but prevents un wear on inlet valve stems, and seemed demonstration to make the control more f ible.

Crank case is of aluminum, so shaped as drop motor considerably lower than frame. The crank case is cast with web tween the supports reaching to the fra members, which prevents mud or dust fr reaching any working parts of motor. C shaft, two to one gears, and valve lifters arranged entirely inside the crank-case, bearing caps on cam shaft and main beari are cast with oil pockets, which fill from splash and insure lubrication of these pa Lower half of crank case is an oil pan and cast with partitions to insure each crank

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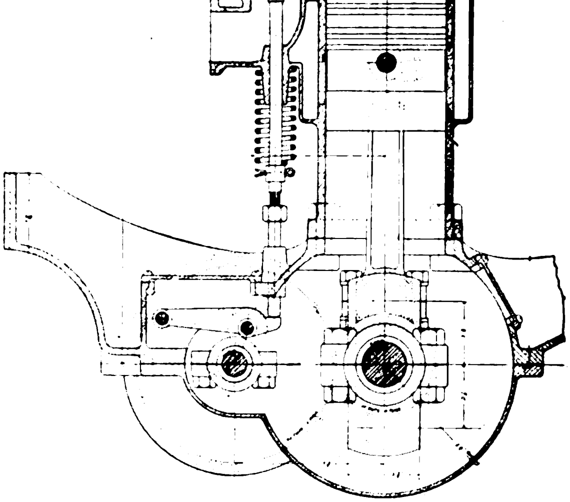
ting its share of oil. There is also an extension cast integral with the bottom half, cylindrical in shape, which houses the steering gear, which is the Brown-Lipe irreversible type. This arrangement not only assures the proper lubrication of the steering gear, but prevents any mud or dirt from reaching it. The crank case is also cast with an extension, to which a sheet aluminum apron is attached for protection of transmission and clutch from dirt and dust.

The main bearings are of a special hard babbitt bearing metal, upon which Mr. Gaeth has done considerable experimenting. The crank shaft is of high carbon steel, cut from solid bar, and after finishing in the usual manner is ground accurately to gauge. It is 1¾ in. dia., main bearings 3 in. long on the ends, 3⅝ in. long in centre, crank pin bearings 1¾ in. dia. by 2 in. wide. Connecting rods are of manganese bronze, H section. The piston pin being fixed solid with connecting rods, and piston pins bearings are in piston and are bronze bushed, with oil groove. This plan is said to assure the piston pin being oiled as long as cylinders are properly lubricated. Crank pin end of connecting rod is fitted with tubular dip, which facilitates oiling.



Sectional End View Geath 1906 Engine.

The pistons, which are of generous length, are fitted with four packing rings. Pistons are ground to gauge with rings in place by an ingenious machine which is original with Mr. Gaeth, and upon which he has just been granted a patent. This assures accuracy, and not only makes pistons interchangeable, but insures the retention of compression.

Lubrication is by Mason Kipp oiler driven which feeds oil to cylinders and cr case. This oiler contains no valves of kind and was adopted by Mr. Gaeth after considerable experimenting with types of oilers. In fact Mr. Gaeth expla that every part that goes into his car ha stand up to rigid road worrk before adopted, a fact which accounts to a grea tent for the high repute in which this is held in its home town, where it has al given a very good account of itself. first car that Mr. Gaeth ever built is running, having been fitted with different and is now used for light delivery, an still giving good satisfaction.

TRANSMISSION.

In the change gear all shafts are high bon steel and all gears are hardened. Sli train is on squared shaft. Gears are 6 p 1½ face, bearings bronze, oiled with c oiler. Ratio of gear 1.6 to 1 on intermed 3.36 to 1 on slow and 4.30 to 1 on rev Clutch is of the contracting band typ dia. x 2 in. wide and is engaged by for pressure of foot pedal. This pedal has ble pad for both ball and heel, and a d ward pressure on heel pad disengages cl

Propeller shaft is of high carbon stee ted with universal joint at both ends. T joints are of large dia., with bearing p hardened. The sliding member being front. The shaft is fitted in rear brake drum 8 in. dia. by 2 in. wide which a contracting band service brake

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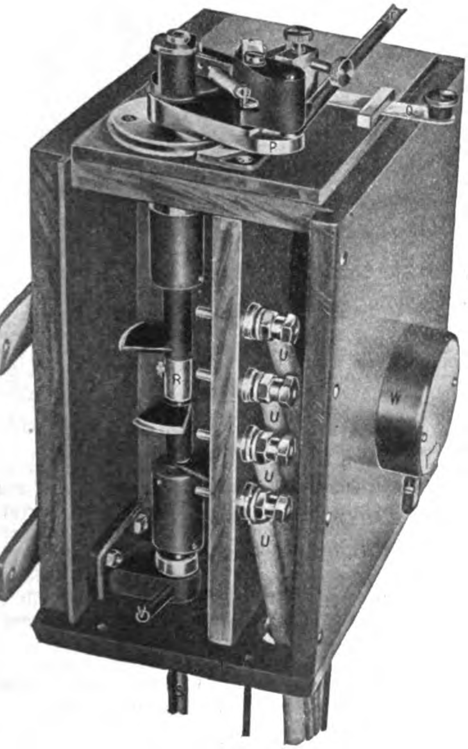

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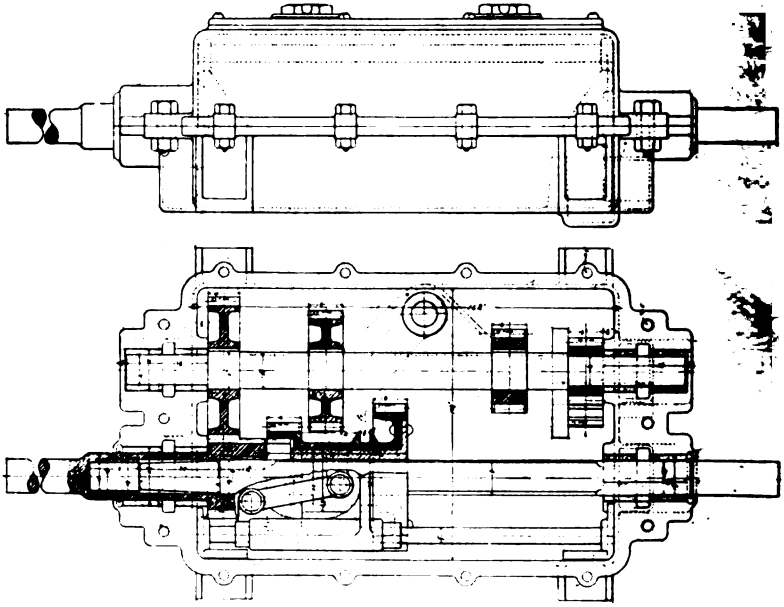
erates.

The torsion rod from rear axle to frame is hung at frame end by bronze casting hinged at top with ball joint at bottom which allow for lateral motion and is entirely different from the usual spring damped type.

Rear axle is a Timken of the floating type, with roller bearings. Wheels are driven with retraced jaw clutch hub caps which are keyed to shaft. Axle shafts are of high carbon, rear axle gear and pinion 4 pitch, gear ratio 2½ to 1.



Transmission of Gaeth 1906 Car.

CONTROL.

Speed changes are on one lever arranged on right of seat and secured by notched quadrant, as is the emergency brake. Right foot pedal applies brake on drive shaft. Left pedal engages and disengages clutch. An interlocking device prevents gear changes when clutch is engaged. Spark and throttle levers are arranged on steering post mast and an ingenious arrangement allows throttle to be operated by hand or by foot pedal as operator may desire.

ON THE ROAD.

At the writer's request Mr. Gaeth hunted up some of the steepest grades to be fou One in particular which exceeded 20 p cent., and for which it was impossible to g up any speed at all as the car had to round very sharp turn just before reaching t ascent. On this hill the car gained speed top gear and was going considerable fast at the top than at the bottom. He al drove down this same grade, stopping c several times to show the efficiency of brak The motor ran very smoothly and regular at all times. The control seemed to be p fect and when throttle was opened car wou fairly jump forward, proving that car had a abundance of power. The clutch started t car very smoothly, the tightening of the clut band in a gradual manner insures this resu The car had no noticeable vibration a motor ran very quietly, being especially qu when car was standing with motor runni throttled.

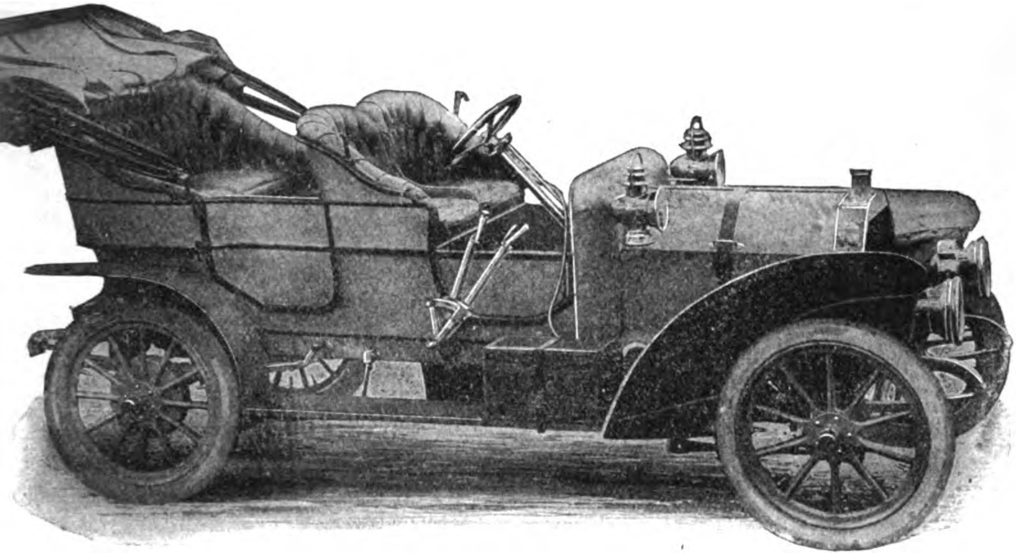
The equipment of all Gaeth cars consis of two acetylene head lights, with generat two oil side lights, tail lamp and horn, all which are supplied without extra charge, a finish is optional with purchaser.

F. W. Stickle, well known to the trade, is president and general manager of the Capitol Foundry Co., of Hartford, Conn., which makes automobile cylinder castings. They take drawings and construct patterns for cylinders under the personal supervision of one of the highest authorities in the trade, who has had wide experience in the production of complicated cylinders. Their methods insure cylinders of great efficiency and the special metal used is not only strong, but easy to machine and possesses the necessary elasticity to withstand the shocks which the nature of their purpose creates.

The Mercedes car which won the relial ity race between Melbourne and Sydn Australia, was fitted with Continental tir marketed by the Continental Caoutcho Company, of New York.

Most foreign cars have aluminum g casings and much difficulty has been expe enced in this country to repair them wh broken. The H. Wilhelm Battery Co., 70 Frost street, Brooklyn, N. Y., have ov come this drawback by a method of th own in which no rivets are used, but broken parts are burned together, making permanent connection.

Oldsmobile



PALACE TOURING CAR, MODEL S

SPECIFICATIONS

Price, $2,250.
Body, Wood. Side door in both front and rear seats.
Color, Grey with black trimmings.
Seating capacity, Five persons.
Total weight, 2300 lbs.
Wheel base, 106"
Wheel tread, 55".
Tire dimensions, front, 32" x 3½".
Tire dimensions, rear, 32" x 4".
Steering, Wheel, irreversible. Worm and nut device.
Brakes, Two; cardon shaft operated by pedal; rear hub operated by lever.
Gasoline capacity, 15 gallons.
Frame, Pressed steel; channel section.
Horse power, 26-28.
Number of cylinders, Four.
Cylinders arranged, Vertically under hood.
Cooling, Gear pump circulating water through flat tube radiator.
Ignition, Jump spark with dry cell and storage cell.
Drive, Bevel gear direct.
Transmission, Sliding gear—one lever—selective control.
Speed, Three forward and one reverse.
Style of top, Canopy or extension top furnished on special order.

For further details address

Olds Motor Works, Lansing, Mich., U.S.A.

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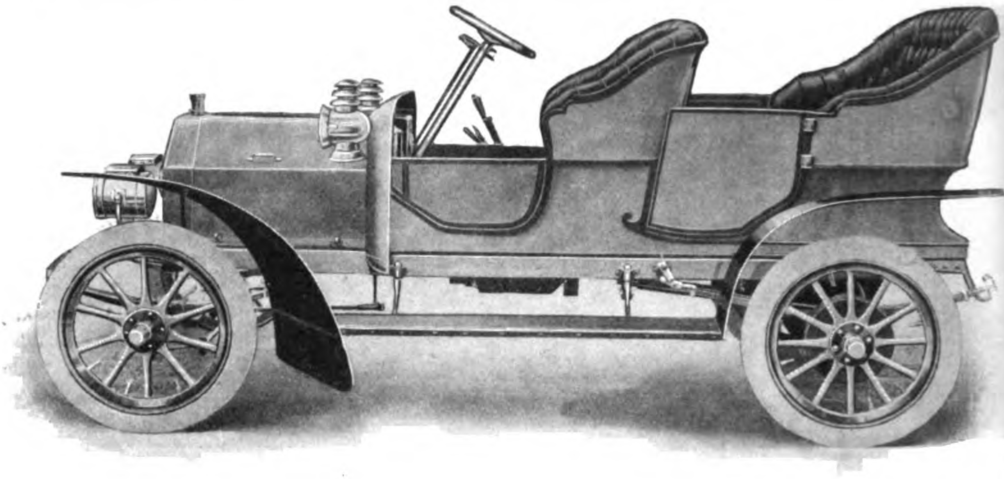
Oldsmobile



THE TWO CYCLE, MODEL L

SPECIFICATIONS

Price, $1250.
Body, Wood; removable rear seats, with beetle baggage compartment.
Color, Grey, with black trimmings.
Seating capacity, Four persons.
Total weight, 2000 lbs.
Wheel base, 102".
Wheel tread, 55".
Tire dimensions, front, 30" x 3½".
Tire dimensions, rear, 30" x 3½.
Steering, Wheel; irreversible; worm and nut type.
Brakes, Two; cardon shaft operated by pedal; rear hub operated by lever.
Gasoline capacity, 15 gallons.
Frame, pressed steel; channel sections.
Horse power, 20-24; 2-stroke cycle motor.
Number of cylinders, Two.
Cylinders arranged, Vertically under hood.
Cooling, Gear pump circulating water through flat tube radiator.
Ignition, Jump spark with dry cell and storage cell.
Drive, Bevel gear, direct.
Transmission, Sliding gear, one lever, selective control.
Speeds, Three forward, one reverse.
Style of top, Canopy of extension top furnished on special order.

For further details address

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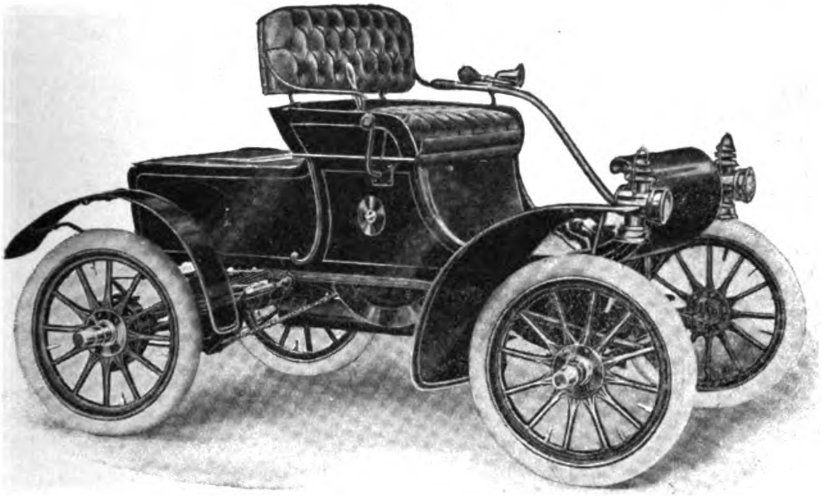

STANDARD RUNABOUT, MODEL B

SPECIFICATIONS

Price, $650.
Model, Curved dash or straight dash.
Body, Wood
Color, Black with red trimmings.
Seating capacity, Two passengers.
Total weight, 1,100 lbs.
Wheel base, 66".
Wheel tread, 55".
Tire dimensions, front, 28" x 3".
Tire dimensions, rear, 28" x 3".
Steering, Tiller.
Brakes, Transmission and rear hub, operated by pedal.
Gasoline capacity, 5 gallons.
Frame, Angle steel.
Horse power, Seven.
Number of cylinders, One.
Cylinder arranged, Horizontal under body.
Cooling, Water circulated by gear pump through copper disk radiator.
Ignition, Jump spark, dry cells.
Drive, Chain.
Transmission, Planetary.
Speeds, Two forward and one reverse.
Style of top, Carriage.

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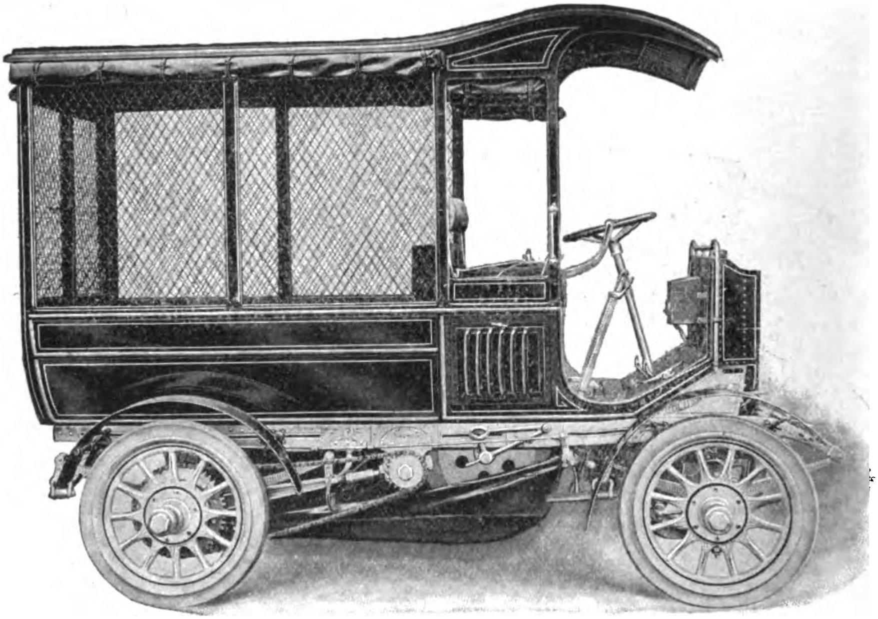

DELIVERY CAR

SPECIFICATIONS

Price, $2850.
Body, Wood, delivery, built to order.
Color, Optional.
Total weight, 3,000 lbs.
Wheel base, 110".
Wheel tread, 56".
Tire dimensions, front, 34" x 4" solid.
Tire dimensions, rear, 34" x 4" solid.
Steering, Wheel.
Brakes, Transmission controlled by pedal, internal hub by hand lever.
Gasoline capacity, 12 gallons.
Frames, Pressed steel.
Horse power, 16.
Number of cylinders, 2.
Cylinders arranged, Vertical under seat.
Cooling, Water circulated by gear pump through radiator on front of dash.
Ignition, Jump spark, dry cells and storage battery.
Drive, Double side chain.
Transmission, Planetary, mounted on counter shaft.
Speeds, Two forward and one reverse.
Style of top, Built to order.

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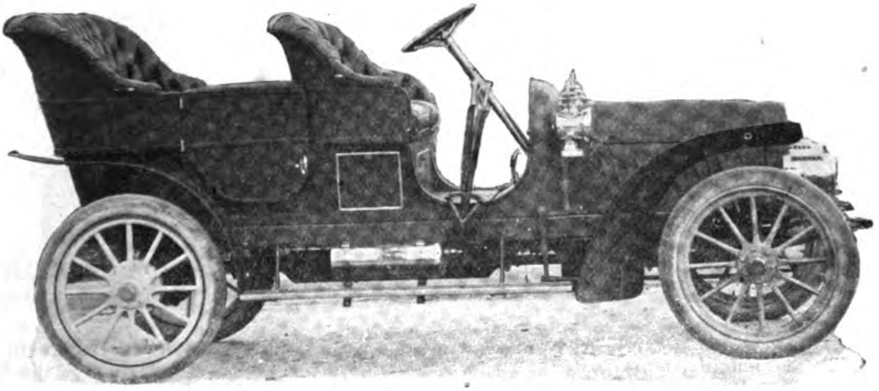
The Premier 1906 Air-Cooled Touring Cars.

HUGH DOLNAR

The Premier Motor Mfg. Company, Indianapolis, Indiana, U. S. A., has had the most successful year of its history in the season of 1905, in which it produced one single style of chassis only, to which various bodies were applied in the side entrance tonneau and runabout forms.



Premier 1906 Model L, 4 4¼x4¼ air-cooled cylinders, touring car, accommodating 5 passengers; 20 to 24 H. P.; weight, 1900 lbs.; price, $2250, with full equipment.

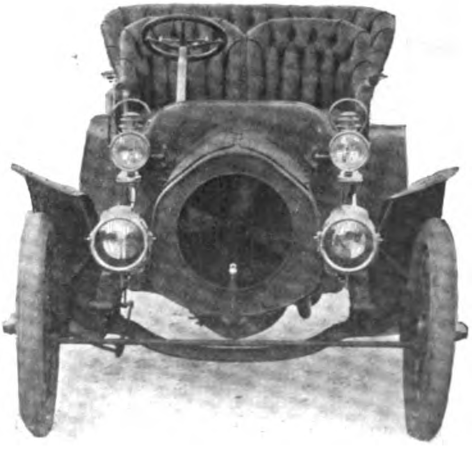
The Premier Company sold its first car in 1902, driven by a two-cylinder, vertical, water-cooled motor. Mr. Weidely, designer of the Premier cars, believed the air-cooled motor to be more suitable for motor car driving, and the first Premier air-cooled motor was sold in 1903, the motor being four cylinders, vertical, set crosswise in front, no fan, chain from crank shaft to planetary change gear, and a second chain to divided rear axle. The compression is about 35 lbs., the valve action being an overhead lever arrangement of Mr. Weidely's own design. A considerable number of these cars with air-cooled motors were sold in 1903, and gave entire satisfaction to purchasers, their good performance fully convincing Mr. Weidely that air-cooling was the only correct thing for car driving.

For the seasons of 1904 and 1905 the Premier continued to put out this same motor in constantly and largely increasing numbers, all Premier cars giving entire satisfaction, and fully sustaining the judgment of their designer by uniformly good performance.

In 1905 Mr. Weidely produced a very powerful air-cooled racer, described fully in our October 1905 issue; it had 4 cylinders 7x5½ in., 45 lbs. compression, which cooled well with the car standing still. This racer did not get into the 1905 cup competition because it was 65 lbs. overweight, and it is not known what it can do when at its best; it has made ¼ mile in 10 seconds, private trial, and has fully convinced its builders that cylinders up to 7 in. diameter, far larger than required for passenger cars, can be perfectly air-cooled without the use of a fan.

The 1906 Premier production will consist of the new 1906 model L, a five-passenger touring car, 4 air-cooled cylinders, tandem, sliding gear and bevel gear to rear axle, here first illustrated and described, and the 1905 Premier model F, with detail improvements.

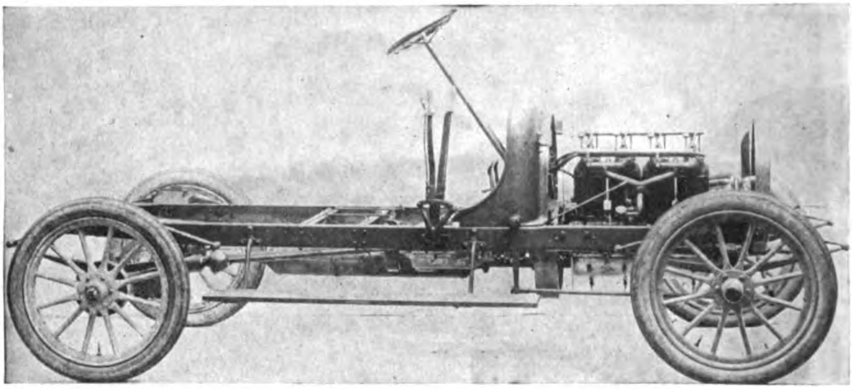
The Premier factory buildings have had material additions in 1905, and the main three-story brick factory building is to be immediately extended nearly double its present size, and as soon as ready the increased floor space will be filled with the best of American tools. Mr. Weidely has had a large experience in machine construction, and in both material and workmanship the Premier



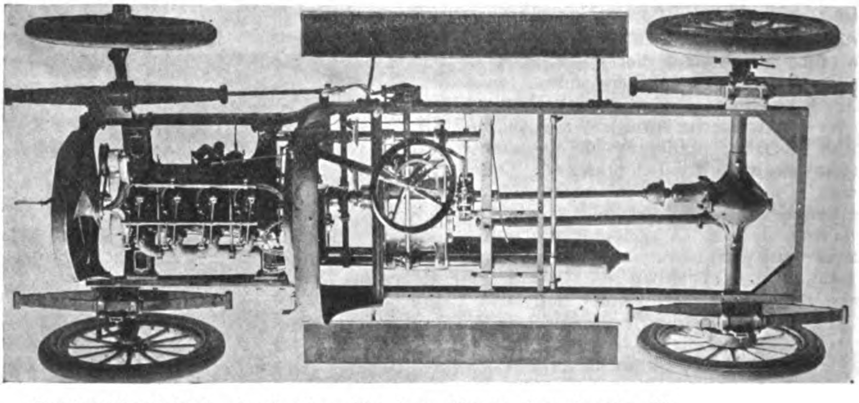
Premier Model L, 1906. This full front view shows contours of the aluminum castings, hood front and front board, bronze casting front axle and brass grill in front of fan, the grill being painted black and the whole front and hood being painted body color, no bright work. The front of the front-board has a filleted flange to take the hood, making a symmetrical juncture. This is a car to satisfy the eye of the trained mechanic. Very little ornament, elegance of outline and suitability and harmony of design characterize this masterly production, which conveys the impression of power, speed and capability of continuous effort.

cars are as good as can be made, and the large increase in plant will insure prompt 1906 deliveries.

The specifications of Premier model L, 1906 touring car, are: Wheel base, 106 in.; wheels, 32x4 in.; spring, four full elliptics; motor, 4 cylinders 4¼x4¼ in., air-cooled, with a fan; compression, 45 lbs.; sliding gear, three speeds forward and reverse, bevel gear to divided rear axle. The nominal horse-power is 20-24. Side entrance detachable tonneau, doors swinging to rear, for five passengers. Weight 1900 lbs. Price $2250.00, including mats, horn, five lamps and full tool equipment, all ready for extended touring.



Premier Model L, chassis side.



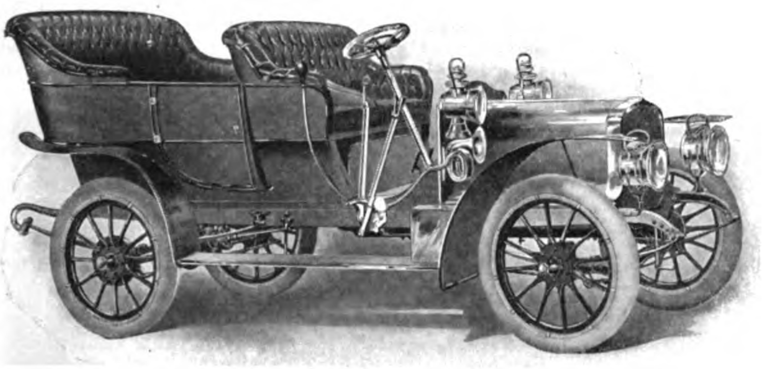
Premier 1906 Model L, chassis plan. The fram sides are channel section 4½ in., greatest depth by 1⅜ in. wide. The frame is 34 in. wide in rear, and 30 in. wide in front. One rear end and one middle cross-girt art applied by hot riveting. The spring hangers are manganese bronze castings, riveted on. The middle cross-girt is a steel casting. The engine base is grey-iron, and has long box lugs, with hand and core holes, and solid ends finished to fix inside the side frames. The sub-frame is two drawn steel tubes fitted to bored seats in the cast cross-girt and the grey-iron engine base lugs.

NOTABLE FEATURES.

The multiple disc clutch is fitted, the motor base lugs are hollow, and are wide open to the crank box and assist in cooling. The chassis frame is of pressed steel, and the sub-frame takes the form of two drawn steel tubes. Aluminum castings are placed for the hood-front and the front-board. The front axle is of manganese bronze; the rear axle has a steel casting gear box, with steel tube sleeves, and the springs are full elliptics. A torsion resisting arm is fitted, but struts are not used.

The full elliptic spring has much more delicacy of action than the half-elliptic, and the vertical opening and closing range of a full elliptic is about twice that of the same length half-elliptic, hence with correctly designed full-elliptic springs the need of the buffers and spring-checks often fitted to make up for want of range and agreeable action of half-elliptic springs disappears, the full elliptic spring alone giving better results in the way of smoothness of carriage than the half-elliptics with all their costly and often-times vexatious additions. A special spring-head construction of the Premier full-elliptics sets up a certain amount of friction in the recovery movement, sufficient to prevent tossing the car body unpleasantly, while not undesirably resisting a delicate spring action in absorbing shocks from small road-level variations.

The speed change is of the selective type; the gear teeth are not only hardened, but the sides of the hardened rings of gear teeth are ground true after hardening, so that the teeth run true, and the squared shafts are ground accurately to size. The side and line shafts run on Hess-Bright type ball bearings; the multiple disc clutch members fixed to the line shaft are very light, and in connection with the ball bearings and the complete



Model E. Light Touring Car. 24 H. P. $2000

Four cylinder vertical, air cooled engine 24 H.P., mechanically operated valves. Jump spark ignition with synchronized system of distribution of the high tension current. Positive force feed lubrication. Sliding gear transmission, selective system having three speeds forward and reverse. Pressed steel frame and steel pan construction. Bevel gear drive rear axle of the floating type. Front axle I beam section, drop forged in one piece. New type worm and sector steering gear. Internal and external brakes on rear hubs. Body of graceful design, side entrance of the latest French type, roomy in proportions and luxurious in appointment. Wheel base 100 inches. Extra long springs, of special design and great flexibility. Wheels, 32 x 3½ inches. Weight, 1800 pounds. Speed up to 45 miles per hour. Two gas lamps, generator, three oil lamps, horn and full complement of tools, constitute the equipment.

Annular Ball Bearings are Employed Throughout

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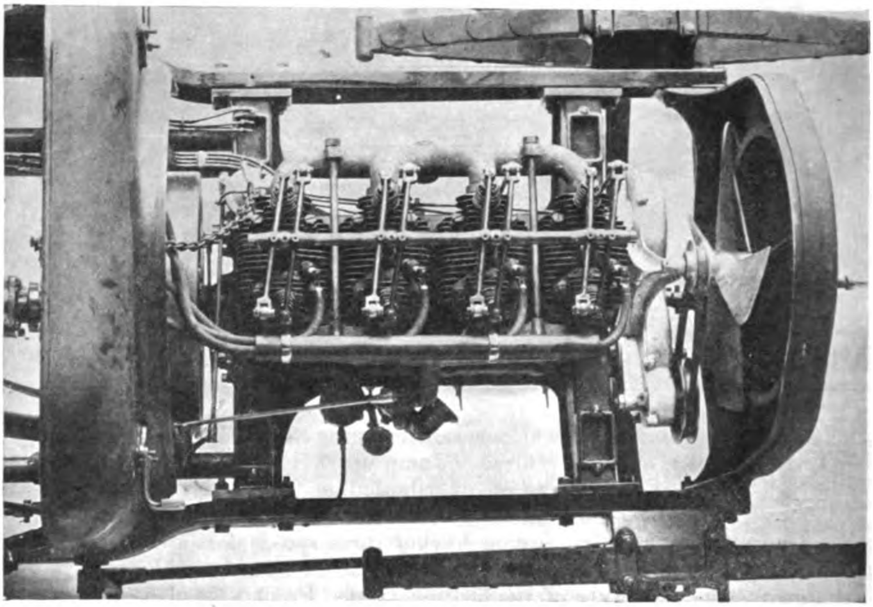
clutch disengagement insured by the application of peculiar clutch disc-separating springs, work together to produce a speed change which is noiseless.

A new steering gear, Weidely design, screw and nut action, has always the same extent of surface engaged, and can always be adjusted to make it equally stiff or free at all points of travel. Pending patent applications forbid a more detailed description of this new steering action, which avoids all the faults of the worm and worm gear segment, and the many wearing surfaces of the screw and trunion-nut steering construction.



Premier plan of motor, showing valve action details and plans of the cast aluminum hood-front and front-board, front end of chassis frame, engine base lugs and front springs. The very long light and slender valve levers are steel drop forgings case-hardened. This shows also a plan of the aluminum gear cover and fan bracket. The whole front construction is notable, because of motor design, cast aluminum fronts and full elliptic springs, which are twice as effective as half elliptics, at least.

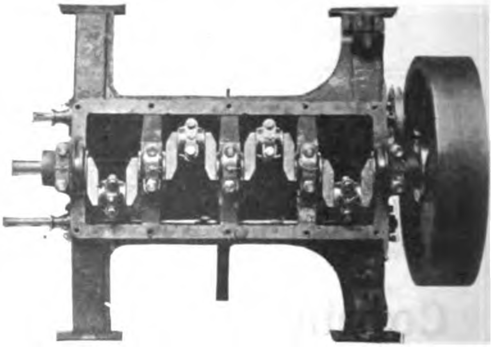
The placing of cast aluminum front boards and hood fronts, gains many advantages. These two pieces can have any detail in the way of supporting feet, flanges, ribs, pads and brackets desired, and can be given long bearings on the chassis frame sides. and thus obtain substantial support. Giving the front board long feet, extending to the rear, permits shortening the body sills. It is also a great convenience in building and testing to have the front board fixed to the chassis frame independently of the body, so that the whole chassis may be fully tested on the road before the finely finished body is attached.

THE WHEELS.

The rear wheels are applied directly to the tapered axle ends, with long keys, nut retained. The internal rear hub brake drums are applied, and are of pressed steel, having hinged bronze shoes fitted metal to metal. The rear axle outside ends are on Hyatt roller bearings, which carry the load. The inner ends of the rear axles are on Hess-Bright type ball bearings. The front wheels are on two circles of ball bearings, ¾ and ⅝ in. diameter.

SPRINGS.

Four full elliptics are placed in both the Premier 1906 cars. The model L springs are all four the same, 38 in. long by 2 in. wide, leaves lipped instead of ribbed, five leaves in each member. The front springs are fixed to both chassis frame and axle. The rear springs are fixed to chassis frame, and revolubly mounted on the rear axle sleeves.



Premier Motor, bottom of motor base.

TORSION ARM.

This member is a single steel tube with spring cushions top and bottom at the chassis frame cross-girt point of resistance, in this first model L from which photographs were taken. This form will be replaced by a torsion resisting arm triangular in vertical plane outline. steel tube members with rear ends above and below the pinion shaft in the bevel

FOR "QUALITY" ONLY

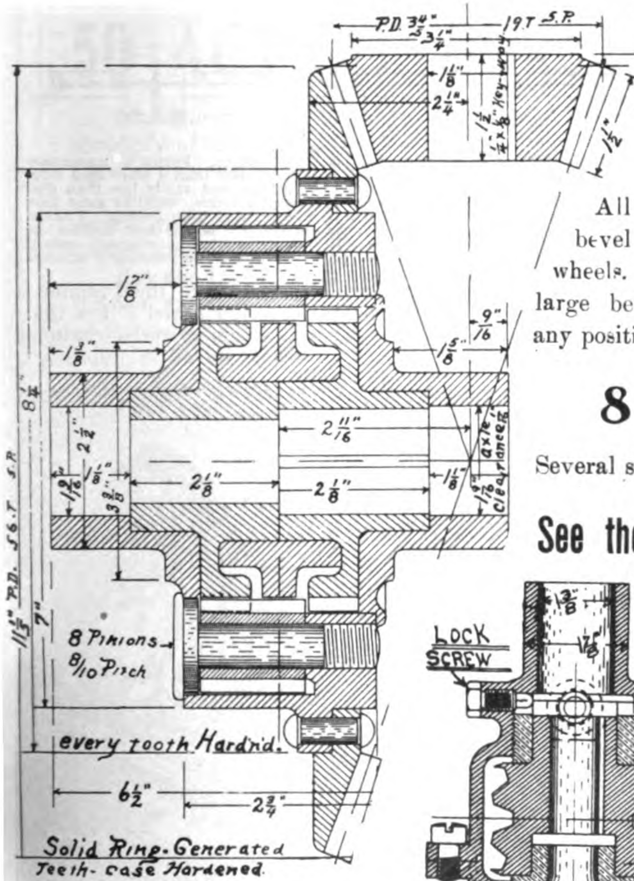
DO WE SOLICIT YOUR BUSINESS ON

DIFFERENTIALS AND STEERING GEARS

THE WARNER 1906 CONSTRUCTION

FOR BEVEL DRIVE, ALL GEARS, INSIDE AND OUTSIDE HARDENED

All sizes in stock, both for bevel drive and sprocket wheels. We can locate the large bevel—or sprocket wheel any position on case desired.


P.D. 3¾"
19 T S.P.
3¼"
1⅛"
2¼"
½ × ⅛ Key-way
1½"
1⅞"
1⅜"
9/16"
1⅝"
8¼
2 11/16"
axle clearance
2¼
1⅛"
3⅜
1 3/16
2⅛"
2⅛"
1⅛"
1 1/16
11½" P.D. 56 T. S.P.
7"
8 Pinions
8/10 Pitch
every tooth Hard'n'd.
6½"
2¾"
Solid Ring-Generated Teeth-case Hardened

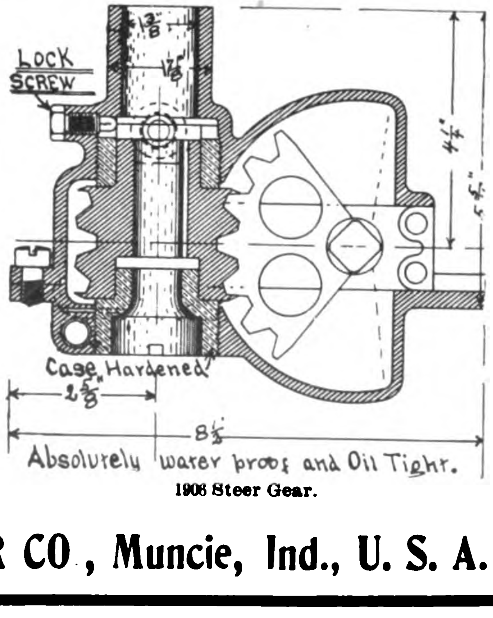
Bevel Drive Differential.

8 Models

Several sizes to select from.

See the "Triple Bearing"

THE WARNER STEERING GEAR FOR SAFETY. 3 TEETH IN PERFECT MESH AT ALL TIMES. HARDENED AND GROUND THROUGHOUT


1⅜"
1⅞"
LOCK SCREW
4¼"
5⅝"
Case Hardened
2⅝"
8½
Absolutely water proof and Oil Tight.

1906 Steer Gear.

Mfg by WARNER GEAR CO., Muncie, Ind., U. S. A.

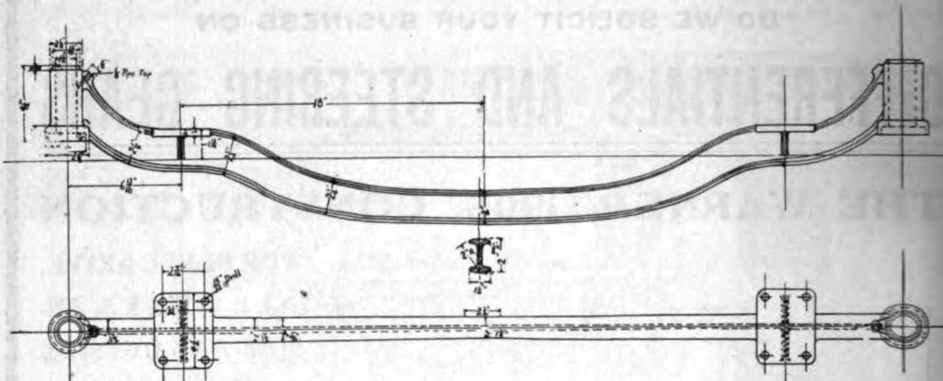
gear housing, and front ends joined under the frame girt.

AXLES.

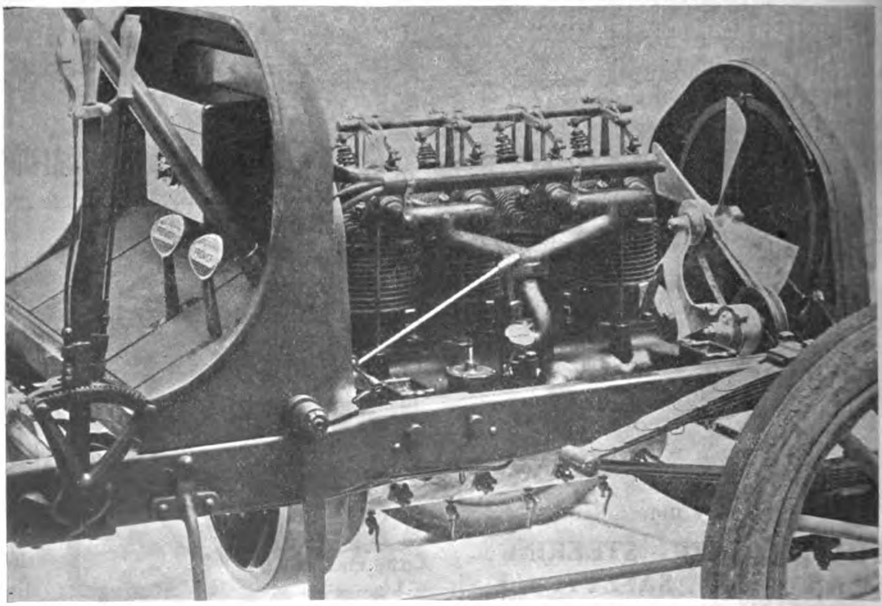
The rear axles are built up of a capped steel casting gear housing, with steel tube sleeves pinned and brazed in place, and the rear spring pads are revolubly mounted on the axle sleeves.

The front axle is a manganese bronze casting, spring pads integral, H section of axle body, which is dropped as shown in working drawing reproduction. One of these bronze axles was supported at the ends and loaded with 3650 lbs. of pig iron on each spring pad, total axle load at working points 73 lbs., and allowed to stand loaded one a one-half hours. This great load was th removed, and the axle showed, by careful r measuring from a previously established ba line, no permanent deflection whatever.

No struts are fitted to the Premier mod L. The chain driven model F has the usu screw adjusted struts to resist chain-pull.



Premier 1906 4-cylinder car, bronze front axle, working drawing reproduction, Parson's manganeze bronze. Weight of rough casting, 31 lbs. Cost about $11.00 each. This is much less than a steel drop forging, without a weld, can be made for. Besides this the patterns for castings cost vastly less than dies for forgings, and in case of the casting the designer can have any shape he wants, while he must look to the forging requirements first, and his own demands afterward, in case of a drop forging. Finally, no shop in this country is fitted to produce drop forgings of these dimensions, in the best manner, at the present time, without a weld, commercially and promptly. The manganeze bronze axle will sustain the greater dead weight load without permanent deflection, or "set," and is the less injuriously affected by fatigue and vibration.



Premier 1906 Model L. Cast aluminum front board. Motor, intake side, fan and rear side of front, also an aluminum casting. The long foot of the front board gives this important member a good support on the chassis frame, and permits shortening the body sills, both desirable features. The fan-bracket and gear cover integral aluminum casting is here partly shown. These details are of interest, as this front construction is very difficult because of the many forms which may be, and are, given to the various members.

THE MOTOR.

The four cylinders, ribbed with thin radi ing flanges set fore and aft, have the exhau and intake valves set at 25 degrees angle the vertical plane, and are worked by ov

WELCH

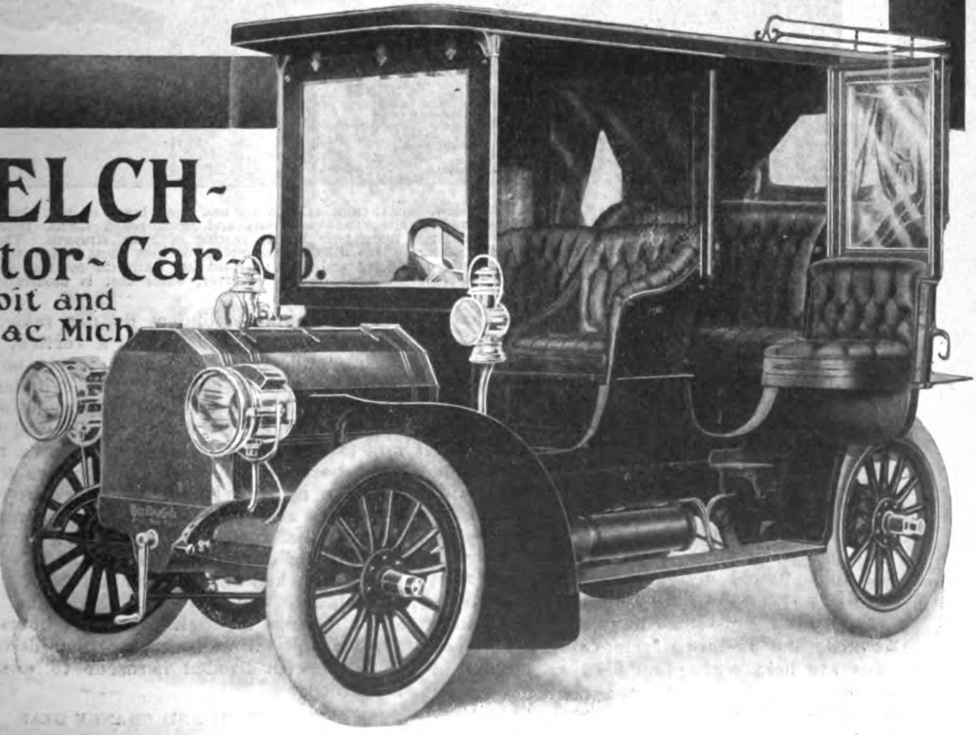
50 ACTUAL HORSE POWER

A combination of imported steels and "hand" workmanship with American simplicity of design and interchangeability, makes of the 1906 Welch, a car equalled by none.

Buy a car whose vital points have been in use practically unchanged for several years, and that is being copied much more extensively by prominent makers than any other car in existence.

Buy one that is guaranteed to give better service the second season than the first, and that will not be a back number in six months through the caprice of the maker, a car that will carry you on the ***direct*** drive from four to fifty miles, or better, per hour, and take ninety-five per cent. of all hills on the high gear. ***Know*** what you are buying. Ask for our treatise on Horse Power and our latest catalog.

WELCH-
Motor-Car-Co.
etroit and
ontiac Mich



head levers hung on a long top-shaft, from two cam shafts, one on each side, inside the crank box. The cams are steel, drop-forged, case-hardened, have hubs and are applied to the cam shafts, retained by one pin taper, riveted, and by one Woodruff key in each cam. The hardened cam rollers are on hard pins in forks milled in cylindrical sliders having cross pins working up and down in grooves cut in the slider guides. These cylindrical sliders have bored seats to take the lever rods, which are secured by the cross pins mentioned. The top levers are very slender light steel drop forgings, stiffened by case hardening. The valves have gray iron heads driven to shoulders and riveted on steel stems, threaded to take spring pads, and case hardened to take the lever temper-screw push. The ports are all 1¾ in. diameter, and the gray iron valves have 45 degrees angle seats in the gray iron cages.

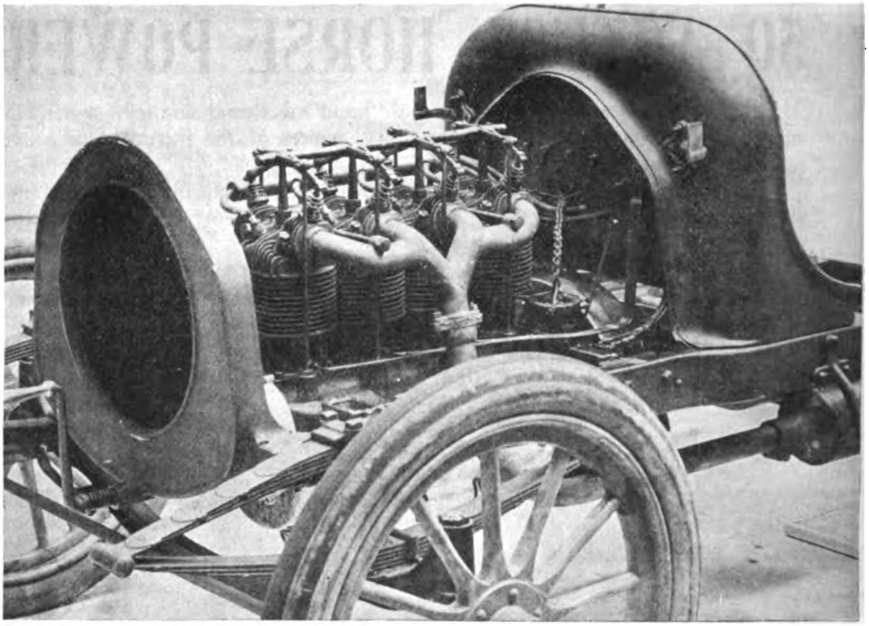
The pistons have four rings, 5-16 in. wide each, three above the pins and one at the open end. The rings are 45 degrees lap, pinned to pistons. The piston pins are ¾ in. diameter, hole through, ⅜ in. diameter. Pins hardened and ground and fixed in pistons by split pins. The pins work in bronze sleeves, not split, forced in top rod eyes. The rods are H-section steel drop forgings, full marine type, white bronze lined at wrist ends, linings flanged, and instantly removable. The rod caps are held with plain 7-16 in. hex. head screws, tapped into the rod bodies, screwed down hard on 7 thin liners on a side, the 7 liners together making up ⅛ in. thickness. The rod cap screws have a lock-plate retention, rod box on wrist adjusted by liner removal.

The crank wrists are 1⅜ in. diameter, crank shaft journals are 1½ in. diameter, except next the flywheel, where the crank shaft is 1⅝ in. diameter.

CYLINDER AND PISTON FINISHING.

Car motor builders are now aware of the importance of piston and cylinder finish as affecting motor power and performance, and all recitals of particulars of practice are of interest.

The Premier 4¼ in. diameter pistons are finished in the lathe only, 2-1000ths small at open end and 8-1000ths small at head end.



Premier 1906 Model L. Left side oblique view, front, front axle, motor and front board of cast aluminum. This illustration shows the cylinder cooling ribs, the hood-front and front board forms, front spring support, and front axle. The front axle is a manganese bronze casting of great strength. The hood front and front board are aluminum castings. This difficult assemblage is here most fortunately treated, the functions of all parts being carefully considered and fully provided for, while the outlines are pleasing, and the impression of speed and power is produced on the observer, while cost is moderate, construction easy, and durability assured.

The Premier cylinders do not take a bar through and are finished on a vertical Baker boring mill, revolving table, turret on overhead vertical tool slide. The cylinders are first pickled, then the ribs are ground outside edges to gage for holding in 3-jawed boring mill table universal chuck, false jaws, removable, bored to fit, deep chuck jaws to take whole or nearly whole of cylinder bore length. Cylinders are chucked and rough bored with single point tool, then taken out, heated to visibility in dark, allowed to stand 24 hours then rechucked and reamed and faced. After assembling, own pistons, rings and crank shaft, motors are belt driven 20 hours with "valvolene" oil and crocus, then driven 30 minutes with flooded kerosene to wash out the crocus.

THE CLUTCH AND CHANGE GEAR.

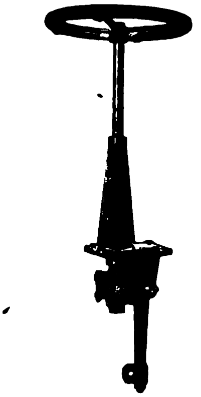
The clutch is a seven disc multiple construc-

GARFORD

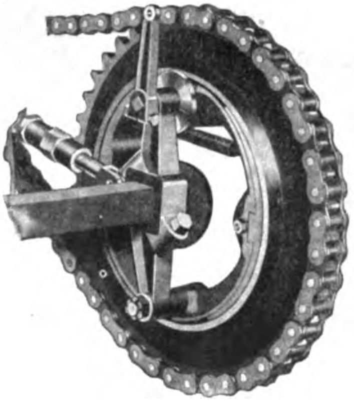
Automobile Parts

For the present we are obliged to abstain from soliciting orders for touring car parts described in Circulars 12 and 13. We cannot accept further orders for these parts without impairing our ability to meet the late season requirements of customers already booked. Our productive capacity for 1907 will be so enlarged as to avoid the disappointment of fruitless inquiry.

It is a vicious commercial policy which openly encourages buyers to expect products which it is privately known they cannot obtain.



Steering Gear—pinion and sector type also supplied



Brake—made in 3 sizes

Motor Wagon Parts

We can, however supply steering gears, brakes and other parts for power wagons of all sizes. These parts enjoy the rare distinction of having been thoroughly tested for years past in the most varied and severest kind of commercial service. They are described in Circulars 2, 3, 5, 10 and 11.

THE GARFORD COMPANY, Elyria, Ohio

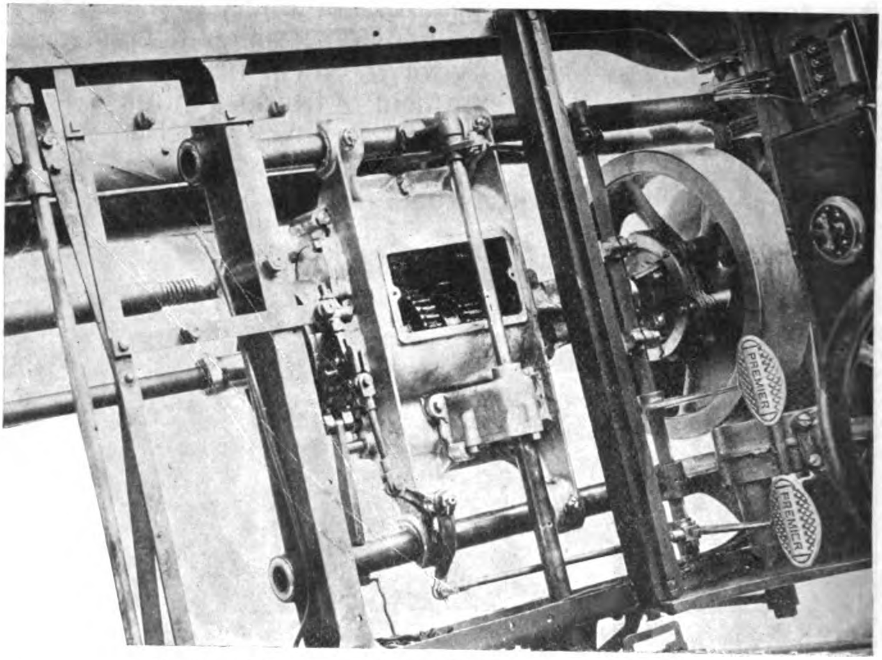
Sales Manager, HAYDEN EAMES, Cleveland, O.

tion, materials of discs now under test. See working drawing reproduction.

The gray-iron flywheel has fan arms to exhaust the hood, and takes the studs which retain the thick clutch discs. The clutch shaft has its front end in a Hess-Bright ball bearing seated in the flywheel, and terminates at the rear in a solid three-jawed clutch member engaging its mate fixed to the change gear line shaft. The change gears are 6 D. P. x 1 in. face, all steel, hardened, and flanges ground true with teeth. The gear casing is aluminum top and bottom, with a hand plate on top.

PROPELLER SHAFT.

One Spicer universal joint is fitted next to the gear case, the squared propeller shaft telescoping in the rear member; a second Spicer joint is fitted on a square at the rear end of the propeller shaft. The front end of the bevel pinion shaft is squared to take the Spicer joint hub. The pinion shaft is carried on Hess-Bright type ball bearings. The bevel gear thrust is taken by a ring of 29 balls ½ in. diameter. The pinion thrust is taken on the forward Hess-Bright pinion shaft bearing. The balance gear is Brown-Lipe spur, with 12 pinions.



Premier clutch and gear box, rockers and control assemblage plan.

THE HOOD.

Great attention is now being given by designers to hood front and side forms, to hood construction, hood doors and fastenings, and the junction of the hood and the front board. The shapes evolved by Weidely for this new model L are extremely pleasing to the eye trained to appreciate simplicity and harmony in machine design. The full front view and ¾ front of the complete model L shows the outlines of the front-board, hood and hood-front. The hood slides are ventilated, and
there are two top doors hinged in the mid
The whole sheet metal body of the hoo
retained by turn screws, and can be quic
removed, so as to give free access to the
tire motor.

THE FAN.

A novel piece of casting in aluminum fo
the front cam shaft gear covers and the f
supporting bracket. The fan is belt driv
and is on ball bearings. The flywheel a
take the fan-vane form, and suck air f
the hood. The hollow engine base lugs
exposed to rapidly moving air, and help
keep the crank box cool.

A circular opening in the hood front
protected by a brass grill, and admits air
the fan. The fan shown is of ordinary fo
with a few wide vanes.

CHASSIS FRAME.

This is pressed steel, see Fig. 5. The fra
sides are pressed steel, channel section, gre
est depth 4½ in., width 1⅜ in.

The frame has one end and one cross g
steel casting only. The grey iron eng
frame lugs are finished and fixed inside t
frame sides. The sub-frame members a
drawn steel tubes, ends in finished cross-g
and motor-base-lug seats.

THE BODY.

The pressed steel fuel tank, curved hea
11 gallons, and battery boxes are carri
under the driver's seat. The body seats
wide, and the rear seat has unusual exte
fore and aft. Very little bright work
shown anywhere. The doors are very wi
swing full open, and are held with a rec
and excellent locking latch. The side a
front lines are shown in Figs. 1 and 1A, a
will meet approval of experts. The spa
under the rear seat is closed forward a

Merkel Auto-Engines

The name "Merkel" when applied to automobile engines is synonymous with the production of motors noted for their speed, power, correctness of design and perfect construction.

An Auto-engine, in order to give satisfactory service, must be especially designed and adapted to the particular style of car in which it is to be used. For the various types of machines to which Auto-engines are adapted there is nothing better offered than the following Merkel models:

For Light Runabout purposes:
Four cylinder, Vertical, Air cooled 3½ in. x 3½ in., 12-14 B. H. P.
" " " Water " 3½ in. x 3½ in., 14-16 B. H P.

For Light Tonneau Cars, complete weight of which does not exceed 2,000 lbs.:
Four cylinder, Vertical, Water cooled, 4 in. x 4½ in., 20-22 B. H. P.

For Large Touring Cars:
Four cylinder, Vertical, Water cooled, 4⅝ in. x 5 in., 35-40 B. H. P.

Merkel Motor Cycles

will be fully described and illustrated in the next issue of this magazine. Watch for it.

The original Merkel idea on grip control will there be fully explained.

The motor used on the Merkel Cycle is without a peer. Both inlet and exhaust valves are mechanically operated. Cams and secondary shafts rest on ball bearings while all main bearings and lower end of connecting rods run on **"Hess-Bright"** ball bearings.

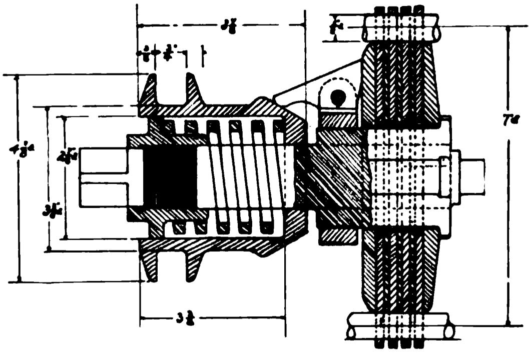
The new Merkel Motor Cycle is acknowledged to be a veritable two-wheeled Automobile.

Representatives wanted for all unoccupied territory.

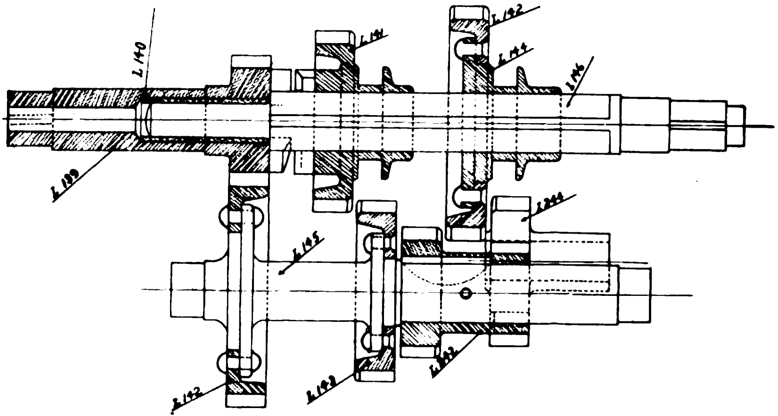
MERKEL MOTOR COMPANY
LAYTON PARK
MILWAUKEE, WISCONSIN

has a large door in the rear, giving large stowage compartment. The standard color will be "Brewster green."

No bright work is shown on hood or grill, and the hood outlines are elegant, and join the front board in curves, giving the impression of continuity and close relationship. It is a very difficult matter to give the front of a car outlines which satisfy demands of service and present an appearance of elegance and unity of design. This car is most satisfactory in these particulars.



Premier 1906 4-cylinder, section of Multiple Disk Clutch, working drawing assembly reproduction. The materials to be used in disks are not yet determined, and the construction shown in this drawing and in the half-tone clutch illustration may be changed. The clutch now in the car has bronze and steel saw plate disks alternating. Front end of line shaft in Hess-Bright bearing in flywheel.



Premier 1906 4-cylinder change gear. Working drawing assembly reproduction. Gearing 6, d. p., 1 in. face.

L 139 Transmission driving pinion, 18 T 6 P.
L 140 Bushing for transmission driving pinion.
L 141 Sliding gear transmission intermediate and high 26 T 6 P.
L 142 Sliding gear transmission low and reverse, also driver for counter shaft 34 T 6 P.
L 143 Gear counter shaft intermediate speed 26 T 6 P.
L 244 Gear, transmission.
L 144 Sliding gear member tra mission.
L 145 Shaft, transmission counte
L 145 Shaft, transmission driving

Shop names here given.

The gearing is all case hardened and then ground on the sides true with the teeth faces. The squared part of the shafts are also ground accurately to size. The side and line shafts are on ball bearings, Hess-Bright typ

STEERING AND CONTROL.

The steering is novel, has ideal features of the first importance, is of uniform closeness or freedom at all wheel positions as it may be adjusted, and is not now described in detail because of pending applications for patent.

The throttle and spark levers are ratchet retained on top of the steering wheel. See Fig. 8. There are two vertical levers, and two vertical pedals.

The outside hand lever stands idly forward, and when pulled backward first disengages the clutch and then applies the rear hub internal emergency brake shoes; this lever quadrant and latch retained.

The outside pedal applies the exterior ca vas lined brake band to the ordinary bra drum, 8 ins. diameter, fixed to the line sh at the rear of the gear box. This ped is not now fitted to release the clutch, thou such was the first intention.

The inside pedal when pushed forward fi disengages the clutch, and then unlocks t change gear lever, rendering it free to ma a gear change.

The inside lever shifts the gear, and locked against movement while the clutch engaged.

The whole control is extremely simple a substantial.

Lubrication is by the Hill Precision oil too well known to require more than menti

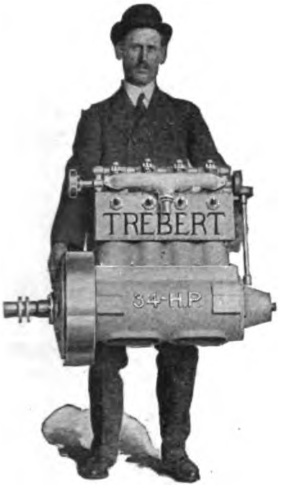
ON THE ROAD.

December 12, 1905, was a most beauti brilliant early winter day, barely cool enou to make heavy clothing comfortable, no wi and the road surface was frozen and smoo most of the way from Indianapolis to Nobl ville going out, short route. The return fr

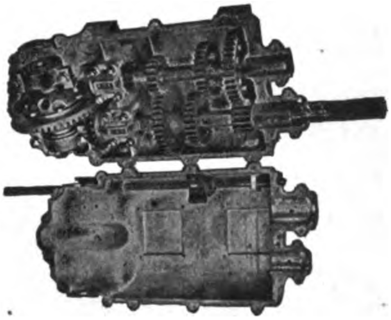
Have You Enough Power?

Trebert's 34 H. P. Motor will go in the same space occupied by your old motor.

It is 30" long, 22" high, 17" wide, weight 340 lbs. It develops 34 Brake H. P., guaranteed.



Here It Is



Our direct and chain drive transmissions are especially designed to stand the strain of our powerful motor.

Detail drawings and description sent on request.

Put it in your 1905 car and have power enough to take you up the steepest hills on the high gear.

Your car will weigh less with our motor in it than with the old one. It will take you over the heaviest roads and surely bring you home.

A customer in Palmerton, Pa., says: "My car weighed 2150 lbs. with a 12 H. P. motor. It now weighs 2135 lbs. with nearly three times the power. It drives my car up all hills on the high gear."

A customer in Hoboken, N.J., says: "We have two hills here that "fix" most autos, and flyers and mile-a-minute cars have to take second gear on them. Your motor took my car up them without any appreciable reduction in the speed."

A customer in Chicago, Ill., says: "It has the power of a brute. It runs like a dream. My car weighs 2700 lbs. I can start on the high gear up hill, in mud."

A customer in Rahway, N. J., says: "I gave a friend from New York who handles nothing but imported cars, a ride in my Pope-Toledo in which I installed your 34 H. P. motor. He said 'I would be foolish to put $12,000 in an imported car when I had one that runs as good as this one.'"

A customer in Stamford, Conn., says: "The 34 H. P. motor has now been running several months in my $8,000 Brazier car. It works beautifully, develops great power and runs smoothly."

Write for testimonial letters and 8 page catalogue containing detail dimensions and description.

We can furnish motor and transmission with all accessories as a unit complete, which will make your present car equal to the best American or foreign cars, so-far-as power plant is concerned, and at a price which will be far more economical than selling or turning in your present car.

Our Mr. Trebert has been identified with the Automobile industry from its inception and will be glad to give you the benefit of his experience, in remodeling your 1905 car.

Send us plan of your chassis and we will tell you how to install our motor and transmission therein. We can make you a proposition which it will pay you to consider.

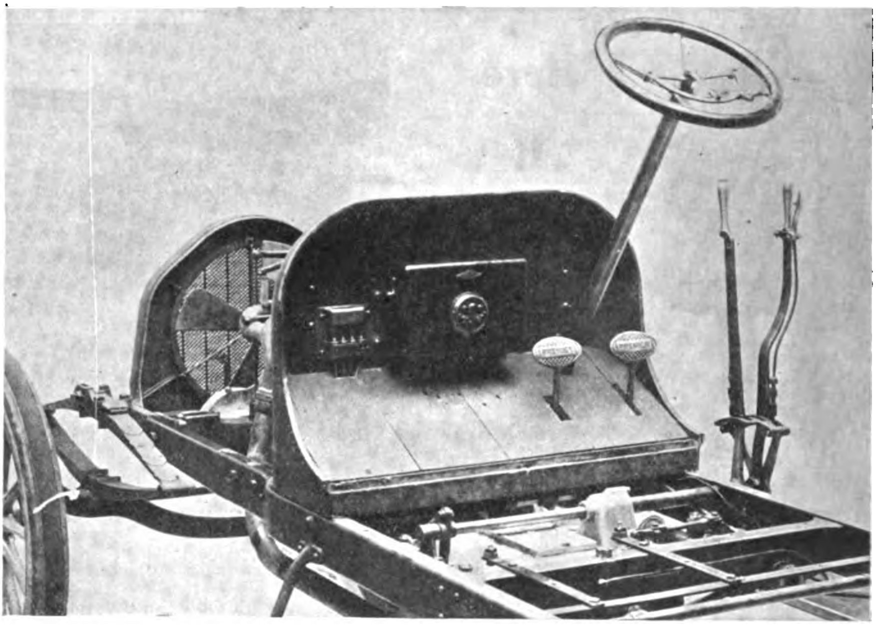
CAUTION: Note our Name and Address.

Trebert Auto & Marine Motor Co.

No. 407 St. Paul Street, Rochester, N. Y.

(We do not make air cooled motors.)

Noblesville was made by the long route through Westfield, Carmel and Broad Ripple and back to the Premier shops, Indianapolis.



Premier 1906 Model L, foot board, front board and control. This illustration gives a rear oblique view of the front board and enough of the hood front to show the shapes. Probably cast aluminum is the best material for these two pieces, which are of the most varied construction in 1906 cars, wood, pressed steel and built up steel and brass constructions of all possible forms being placed by various makers. The present example presents a homogeneous design of pleasing contours.

The car was that pride of Weidely's heart, the 1906 new Premier model L, carrying Clifford Waltman and S. Jameson in the tonneau, Weidely at the wheel and Hugh Dolnar beside him. The start was made at 9:25, and Weidely drove to Noblesville Court House, time 50 minutes, exactly, distance about 25 miles. The road surface was mainly good, but extremely crooked, requiring steering every foot of the way. Running in from Noblesville on the long way return, Clifford Waltman drove. The return road was much rougher than the course out, and all were glad to be on their feet for 10 minutes at Broad Ripple, 8 miles out of the city. The car was driven into the Premier shops at 11:45 A. M., total elapsed time 140 minutes, total time on the road 120 minutes, distance a little more than 54 miles. Going out there were not very many stops for horses, and the time was much better than returning, because Weidely handled the car to perfection, while on the return the roads were full of teams, many driven by women, and delays followed one after another. The course covered has plenty of short hills, about like the Detroit-Pontiac run, though much more crooked. There was no recorder on the car, but the pace was pretty fast at times, quite fast, as may be guessed from the time and distance and delays.

Long before this run the writer had learned that no attention at all need be paid to Weidely's air-cooled motors. They simply run just as fast as any driver cares to have them go, always cool enough, always ready, still and swift. It was therefore exclusively to the action of the four full elliptic springs under this new Premier, that the writer's attention was directed. No buffers and no spring checks of any sort were fitted, and the road was rough and crooked to quite a sufficient degree for bouncing and side sway test.

So many men who should know, have so many times assured Hugh Dolnar that no possible form of full elliptic springs could be soft and easy and free, and yet carry a car at quick pace over bumpy roads without great passenger discomfort from bouncing and side sway, save when fitted with efficient spring checks that it seemed this must be true, and that all these fully convinced advocates of half-elliptic springs must be right, and Weidely must be wrong with the sensitive full elliptics, wholly unfettered, placed under this first model L.

It did not take two miles of run over the hard surface of the frozen clay road after the car left the asphalt, to prove Weidely right, and all the half-elliptic advocates wrong. Hard road had plenty of hollows and bumps, and was crooked as a snake, and the pace was well on top of 40 miles, yet every one sat at ease, no side sway, no tossing, no closing of the springs when the car jumped out of deep ruts, everything smooth and fast and silent, and where the road was free, the swift flight through the bright sunshine with the crisp air rushing past was most exhilarating.

Weidely placed eight sets of full elliptics under this car body, of various lengths, and toiled patiently with the permutations until

The National Show of 1906

WILL BE HELD AT

Coliseum, First Regt. Armory, **CHICAGO**

February 3-10 inclusive

Under the auspices of the N. A. A. M., Inc.

One hundred exhibits of Autos.

One hundred and fifty exhibits of Accessories

77,000 square feet of exhibition space

The largest and only comprehensive display of American and foreign cars of the season

Free admission of dealers to the morning sessions

Further details obtainable of
S. A. MILES, Manager
New Southern Hotel, Chicago

he found exactly what his weight distribution demanded, and the writer has never ridden in a car that took all kinds of road surface variation in a manner at all superior to this model L, innocent of three point suspension and all spring help and hindrance. The crooked wheel track with deep ruts should have kept us bouncing from side to side and up and down all the time at the pace, but did not disturb any one in the least, and the 54 miles could have been made with no stop in 100 minutes without fatigue to passengers if there had been no horses on the road.

As for the motive power, the throttle was never more than half open, and the muffling was perfect silencing. This car can hold a 50-mile clip steadily and take everything on the high gear where it has a free road, while the springs are perfection, and show that full elliptics properly proportioned need no helps of any kind to make easy riding.

Weidely don't say much, but the Premier crowd think model L is as good as it looks, which is enough, for it certainly has elegant lines.

The Aerocar Co.

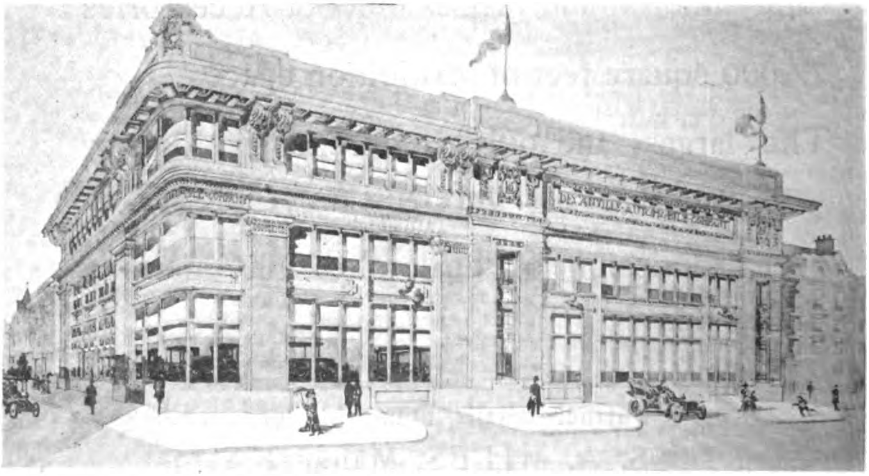
The Aerocar Co. has recently been organized in Detroit, Mich., by A. Y. Malcomson, W. G. Morley and others, and now has a large factory with a frontage of 400 feet in course of construction on Mack Ave. Mr. Malcomson was one of the organizers of the Ford Motor Co., and W. G. Morley, who was formerly with the Olds Motor Works, will be general manager of the new concern. Their car will be equipped with a 4-cylinder air-cooled engine made by the Reeves Pulley Co., and they have contracted for the entire output of the Reeves Co. E. J. O'Hagan, formerly with the Winton Co., will be the factory superintendent, C. Pfahler, a graduate of the Technical University of Berlin, will be the chief draughtsman, and H. H. Thorp, formerly with the H. H. Franklin Mfg. Co., will be sales agent.

The factory, which is being put up in record breaking time, is expected to be ready for occupancy some time in January; meanwhile, the company are occupying temporary offices at 59 McGraw Bldg., Detroit, and have built their sample machines in outside shops for exhibition at the Armory show.

Deere-Clark Motor Car Co.

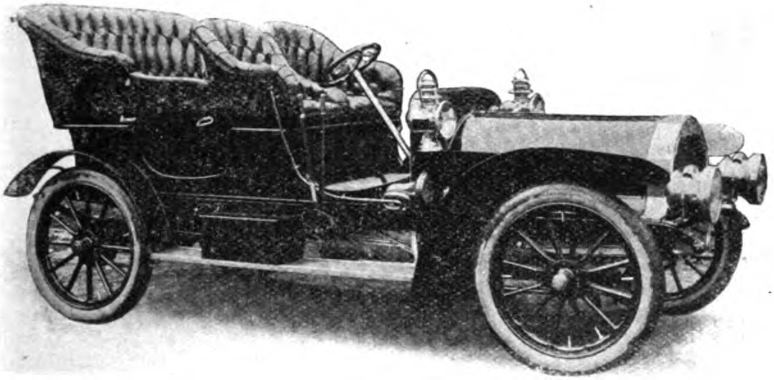
Deere-Clark Motor Car Co., Moline, Ill., recently succeeded the Clarkmobile Co. Their factory, 100x300 ft., is now in course of erection on a tract of ground comprising 12 acres, on which will also be a ½-mile testing track. They will put on the market a 22 H. P. two seated car called "The Deere," which will list at $2000. They will also start early in the season on a two ton truck. Mr. Clark has had ten years' experience in automobiles, and built his first car in 1900. The officers of the company are C. H. Deere, president; W. E. Clarke, vice-president, and C. F. Drury, secretary and treasurer.

The Schuman Carriage Company, Honolulu; Turndall & Jones, Dundee, New Zealand, and Neil & Co., London, England, have been appointed as agents for the Schebler carburetor, made by F. H. Wheeler, Indianapolis, Indiana.



New building of the Decauville Automobile Co., at 56th street and Broadway, New York, lately occupied by it and its allied company, the Dac Auto Supply House. In addition to the Decauville and Franklin cars and the imported accessories and supplies now handled the Decauville Co. will hereafter be the New York agent for C. G. & V. cars. The lot on which their new building stands is L-shaped with three fronts, one on 56th street, one on 55th street and one on Broadway. Salesrooms are on the ground floor; the general and private offices on the two upper floors, only three floors being at present erected. The garage is in the rear of the office building and is 75 feet wide by 200 feet long, running from 56th to 55th street. The main floor has 17 feet head room and has 200 lockers on a mezzanine gallery running along both sides. The walls are covered with white glazed tiles. There are only nine columns in the whole building, each span between columns measuring 37 feet. The construction is entirely fireproof. The four large washstands are located down stairs.

Jackson



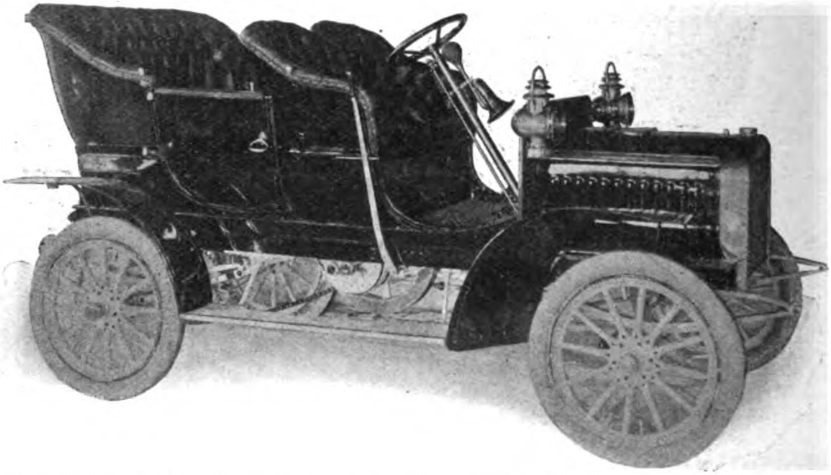
Model "G". 40 H. P. 4 Cylinder. $2500.00

This is the much-talked-about 1906 four-cylinder "Jackson" car that develops irresistible power and sells for only $2500.00; massive 34" artillery wheels with 4" tires; 108" wheel base; handsome, commodious body, seating five persons comfortably; bevel gear drive; sliding gear transmission, three speeds forward, and reverse; machine elegantly finished and upholstered, and regularly furnished with a splendid pair of gas lamps and generator, in addition to the usual equipment of automobiles. It gives every promise of being the sensation of 1906.

Jackson Automobile Co.

Jackson, Michigan

Jackson



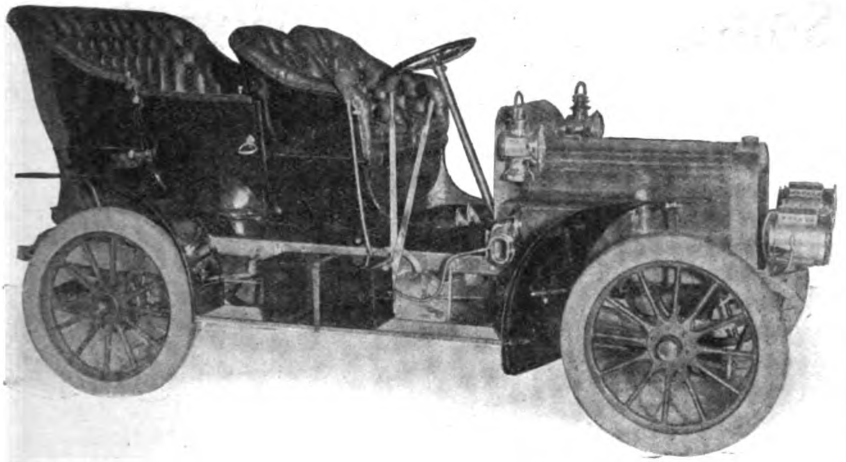
Model "C". 24 H. P. 2 Cylinder. $1250.00

This car made so splendid a reputation for itself in 1905 and is so generally well known, that little needs to be said regarding it, except that its manufacture will be continued, substantially without change. Only a few minor improvements have been made in its construction. It is a handsome touring car with plenty of power and endurance, carries five persons comfortably, and can always be relied on to get there on time. It proved so good a seller that our agents strenuously objected to any thought of abandoning it, and we readily agreed with them. It probably hasn't an equal, in automobile value, anywhere near the price of $1250.00.

Jackson Automobile Co.

Jackson, Michigan

ANDREW JACKSON
Jackson



Model "D" 24 H. P. 2 Cylinder. $1500.00

This car is in many respects the counterpart of the famous Jackson Model "C", but is of costlier construction. The motor is of the same type, with 5¼ x 5 bore and stroke. but instead of lying horizontally under the body it is placed transversely across the frame, under the hood, providing readier accessibillty. We retain the full efficiency of our motor in this model, and believe, therefore, that we have in this the most powerful shaft-drive, two-cylinder car on the American market. Every point is strong and mechanically as nearly perfect as it can be made and neither effort nor expense has been spared to make this the ideal car for those whose preference is for bevel gears and forward motors. The finish and equipment (gas lamps, etc.) is first-class throughout.

Jackson Automobile Co.

Jackson, Michigan

Jackson

Some Jackson "Winnings" For 1905

SECOND in non-stop run from Chicago to St. Paul. The car first in was a $4000.00 machine.

FIRST in race at St. Paul for cars that participated in the Chicago-St. Paul non-stop run.

FIRST in race at Detroit for $1500.00 cars and under; time for five miles, 7.31.

FIRST in run to Port Huron; 156 miles of bad roads negotiated in seven hours.

FIRST in race at Newark, N. J. for cars of 24 H. P. and under; five miles in 7.52.

FIRST at Grand Rapids in five-mile race for $1500.00 cars and under; time, 7.10.

FIRST at Grand Rapids in five-mile race for championship of Western Michigan; time, 7.28.

WORLD'S RECORD—And at Grand Rapids—1905, as a fitting close to the season, a stock Jackson Car that had done over 4000 miles service on the road didn't do a thing but smash the world's five-mile record for two-cylinder cars, reducing it from $6{:}19\frac{3}{5}$ to $6{:}18\frac{1}{5}$.

And yet the Jackson is not designed or constructed for racing, but just to meet every-day conditions—"No sand too deep, No hill too steep." That's where these winnings are significant.

Jackson Automobile Co

Jackson, Michigan

GEECEE

DRY STORAGE BATTERY

Scientifically Designed and
Constructed Throughout . .

An Electrical Reservoir which gives you electricity whenever you need it. An unequaled ignitor, higher in capacity and voltage than any liquid storage battery now on the market.

IMPOSSIBLE

to leak or slop, as we employ electrolyte of solid consistency.

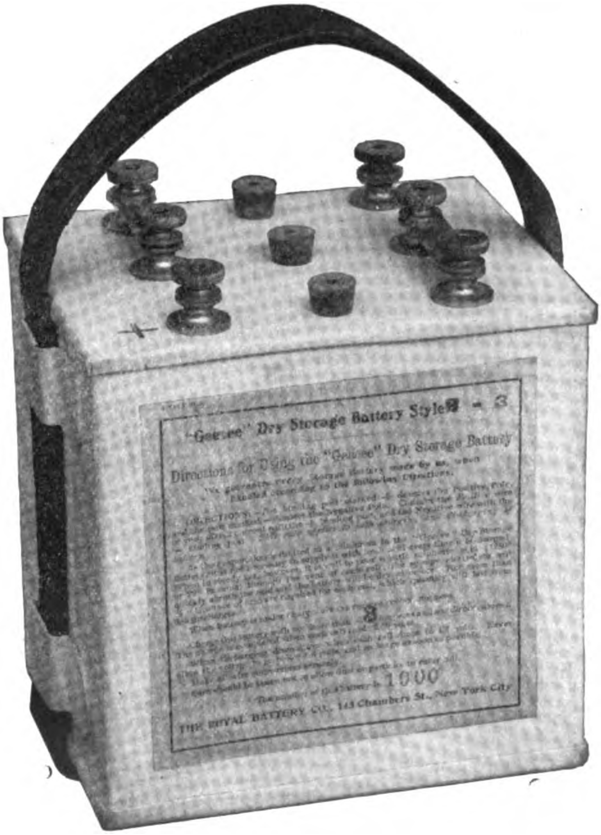
The only non-liquid storage battery in the world.

Can be recharged the same as any wet storage battery.

No acids to spill—no fumes, no leaks.

It not only has non-spilling qualities but the solid electrolyte acts as a separator, keeping the plates from coming into contact, therefore, rendering

Short-Circuiting Impossible

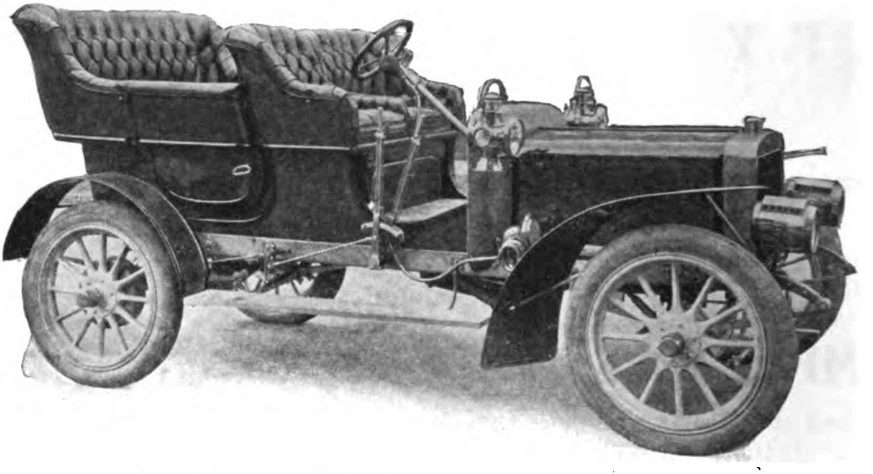

"Geecee" Dry Storage Battery Style 3
THE ROYAL BATTERY CO. 143 Chambers St., New York City

They are guaranteed to work satisfactorily for two or three years.

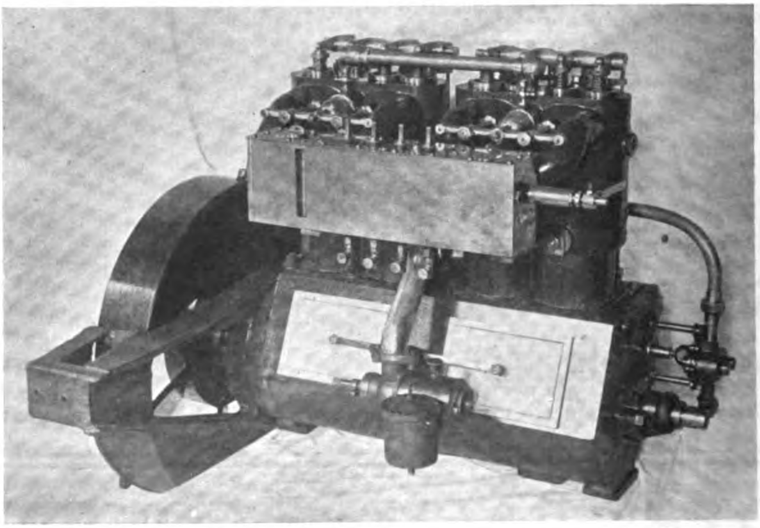
ROYAL BATTERY COMPANY
143 Chambers St., New York
National Sales Corporation, 256 Broadway, New York

The "Dorris" Car.

Dorris Motor Car Co., 1211-1217 N. Vandeventer street, St. Louis, Mo., are now ready with the "Dorris" car, a description of which follows.



The "Dorris" gasoline car, 4 cylinders 4¼x5, 3 speeds forward and reverse.



Inlet side of engine, Dorris gasoline car.

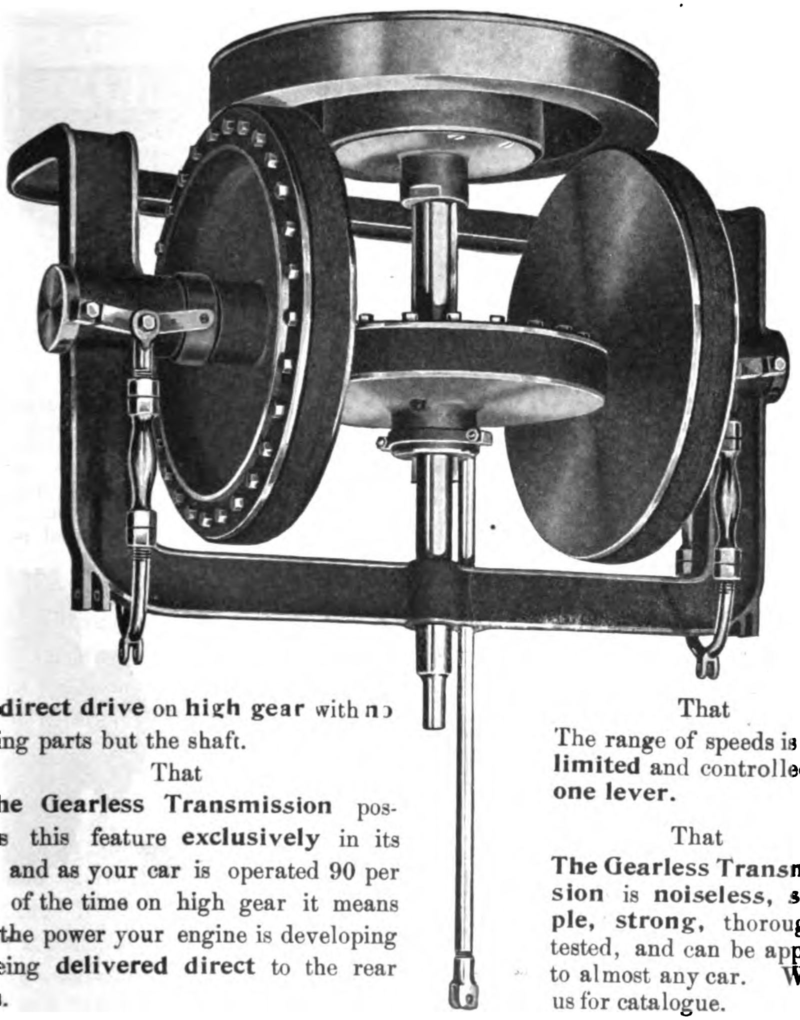
The motor is four cylinders 4¼x5, vertical, placed in front under a hood. The crank shaft is of unusual size, drop forged, and runs in Cramp's Special Bearing Metal bushings, which are easily replaced without losing the alignment of the engine. The crank has a flange forged integral at its rear and carrying a 22-inch fan flywheel which acts as a fan and which includes the multiple disc clutch. The valves are inverted and placed directly in the cylinder heads, which reduces the combustion chamber area to one third less than the side pocket type, thus reducing the loss of heat and power through radiatio
This arrangement also gives a free admissi
and exhaust. The entire circumference
the valves, with the direct pipe connectio
give this type of engine a good speed and co
sequently great power for a given size cyli
der. All valves and their cages are inte
changeable; all valves mechanically operat
The cylinders are cast in pairs with th
jackets integral. They are machined, bor
and ground by a special grinding machi
(built especially for the Dorris Co.). The p
tons are made very light, are fitted with fo
eccentric lap jointed, re-turned rings, a
ground. The piston is fitted with two bron
bushings which are twice the size of
average and as the piston pin is clamped ti
in the connecting rod, the cylinder oil wo
directly into these bearings. The piston p

DO YOU KNOW?

THAT

The Gearless Transmission

(**Patented**)



Is a **direct drive** on **high gear** with no moving parts but the shaft.

That

The Gearless Transmission possesses this feature **exclusively** in its type and as your car is operated 90 per cent. of the time on high gear it means that the power your engine is developing is being **delivered direct** to the rear axles.

That

The range of speeds is **unlimited** and controlled **by one lever.**

That

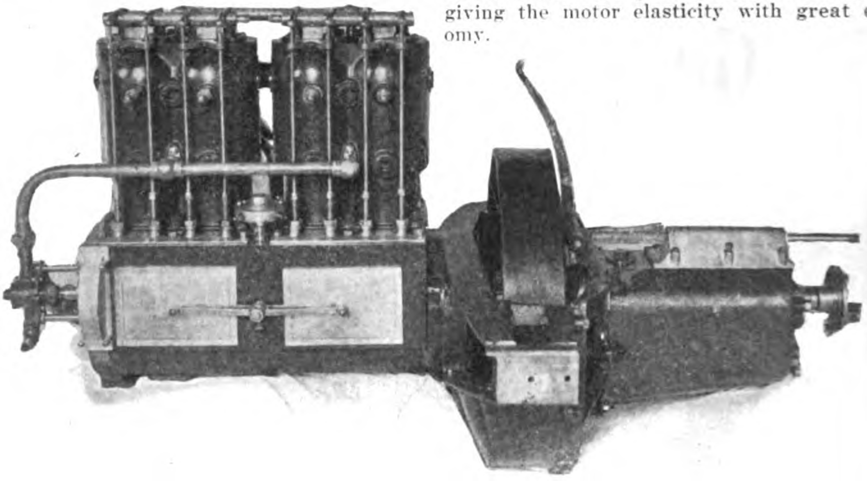
The Gearless Transmission is **noiseless, simple, strong,** thoroughly tested, and can be applied to almost any car. Write us for catalogue.

SEE US—Room G, Gallery—Armory Show, New York

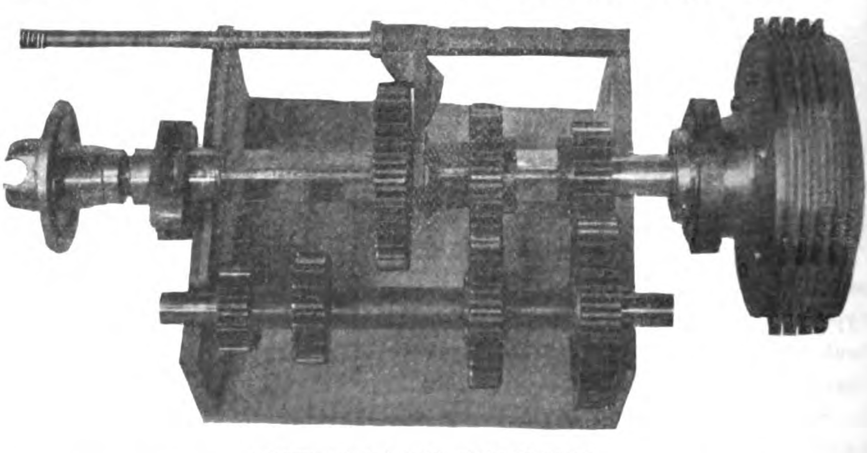
GEARLESS TRANSMISSION CO. **Glens Falls, N. Y.**

are tool steel, hardened and ground and have a ½ hole through their length to reduce weight.

The connecting rods are drop forged I-beam section, are very light and strong for the work they are to do. The cam shaft is of one piece having the cams integral so that it is impossible for the same to get loose and lose their setting. The cam shaft and timer gears are enclosed. The entire motor and transmission is a unit supported at three points only in the frame. This secures perfect alignment, avoids necessity of a sub-frame and the universal joints between motor and transmission, and greatly simplifies the mechanism.



Exhaust valve side of engine of Dorris car, showing also the transmission case.



Transmission and clutch of the Dorris car.

The ignition is by jump spark, using a quadruple dash vibrator coil having the coils made is separate units, with imported French timer. One six volt storage battery and one set of dry cells are furnished.

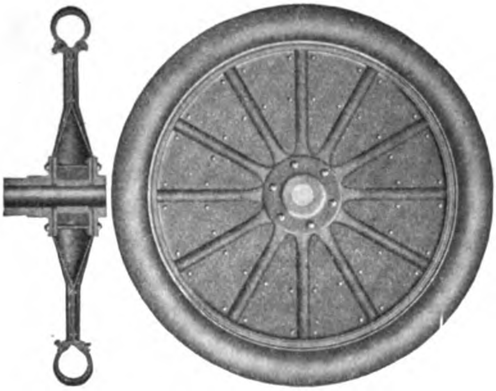
The mechanical lubricator which has an individual pump for each feed is bolted to the cylinder jackets on the right side of the motor and is driven by an eccentric and rod from the cam shaft operating an enclosed toot ratchet in the oil box thus making the o ation positive, discarding the slipping b and pulleys. The oil box is fitted wit bleeder test and each feed is individu adjustable.

The carburetor is float feed type v piston throttle and auxiliary air open which makes the gas uniform at all spe giving the motor elasticity with great e omy.

The clutch is of the multiple disc variet ample capacity, is completely housed and r in oil. Its construction is such that i self-adjusting and will wear indefinitely w out attention. It starts the car without jerking or biting action, thus saving the er transmission, drive and tires from unneces strain. It is operated by a foot pedal. T transmission is of the sliding gear type gi three speeds and reverse. The gears ar ample size made of drop forged nickel s hardened, with ground shafts. The driv direct on the high gear. The transmissio enclosed in an oil tight case and is prov with an inter-locking device which prev the changing of gears without releasing clutch. The running brake is fitted to

SAFETY
SPEED
SATISFACTION

THE INDESTRUCTIBLE STEEL WHEEL



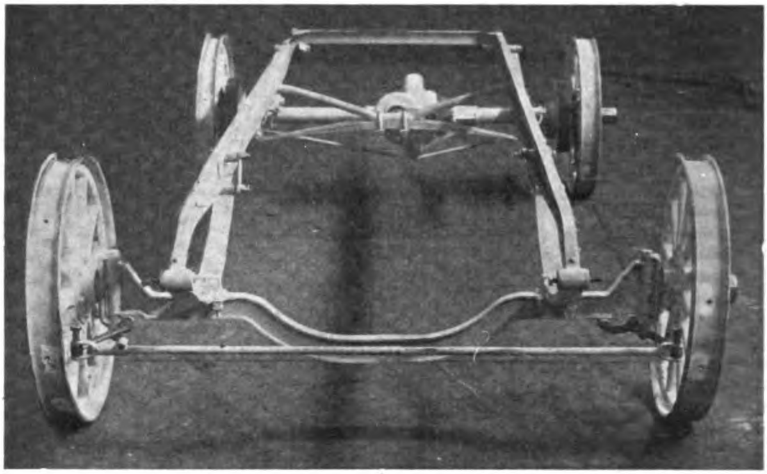
YOU have probably noticed that many racing machines cover the spokes to avoid wind resistance. This is proof positive that this type of wheel is speedier than the ordinary spoke wheel. Our construction also makes it lighter, and considerably stronger. There is no danger of its collapsing under sudden strain as the result of a burst tire. With the increase of horse-power and speed of automobiles, there are increased dangers. These should be minimized. The wheel is one of the chief items to be considered. Our construction is the solution of the problem. In appearance it is really artistic. It is just a question of becoming accustomed to this construction, and after they are universally used, the other style of wheel will look antiquated and peculiar. No other wheel construction should be used for commercial vehicles. Their strength makes it absolutely necessary for this type of vehicle. Manufacturers first to adopt it will profit as a result of giving to their trade something new and something better. Write us for further information.

TURNER & FISH,

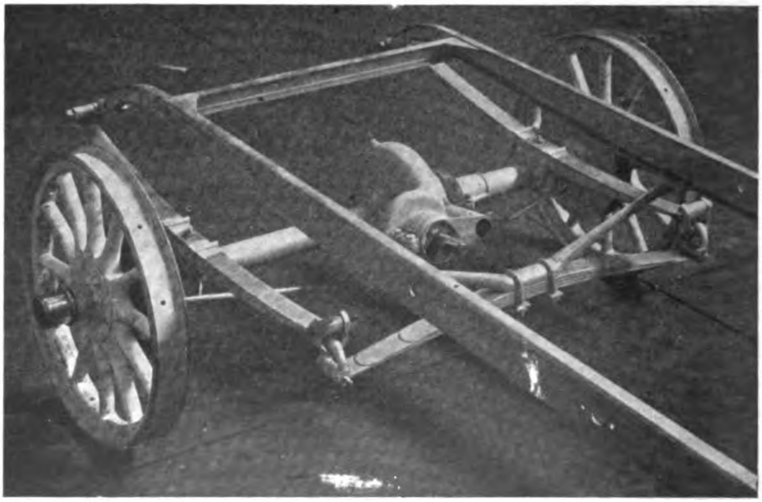
21 Quincy Street CHICAGO, ILL.

rear of the transmission case and is operated by the extreme forward movement of the clutch pedal.

The propellor shaft consists of two full universal joints, grease packed, made up of drop forgings, hardened and ground. The shaft is squared at one end which forms a telescopic joint, allowing perfect freedom in the drive. The rear axle is bevel gear driven, all gears being hardened. The bearings are Timken throughout and are adjustable. The entire axle is housed and perfectly protected from dust. The front axle is drop forged, of nickel steel and is of I-beam section very strong with comparatively light weight. The steering knuckles are of extra heavy pattern of ample size and fitted with Timken bearings. The wheels are built up of pressed steel flanges, with the best hickory 1½-inch spokes and 32x4 inch rims. Emergency brakes are fitted to the two rear hubs, the drums being 12-inch diameter of pressed steel



Front view frame and running gear of Dorris car.



Rear axle and spring, Dorris car, top view.

with adjustable camel's hair belt-faced sh
They are operated through a side lever w
ratchet and connected by rods, no cable be
used. When the brakes are in use the clu
is automatically released.

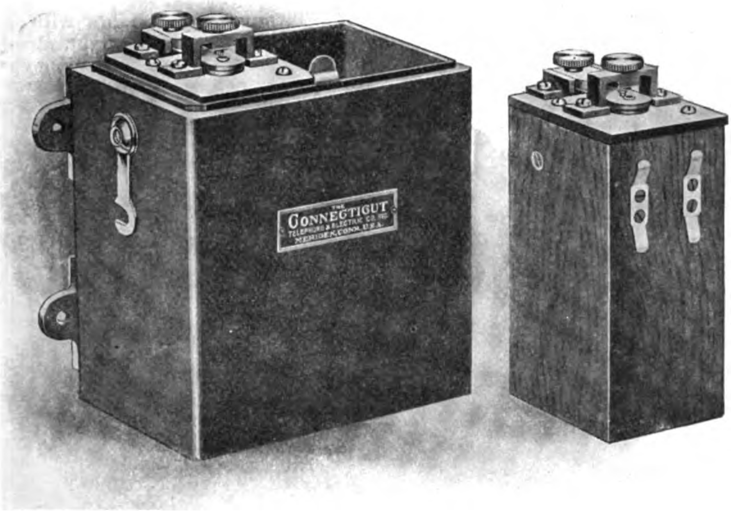
The frame is of pressed steel of am
strength. It is supported in front by t
semi-elliptic springs and in the rear by a
of platform springs giving easy riding acti
as well as the three point suspension in t
rear which avoids warping of the frame
traveling rough roads.

The radiator is of the finned tube type, t
water progressing from cylinders to the top
radiator thence through four strands of ho
izontal tubes at a time to the bottom. Fr
there it runs to the double gear direct driv
pump, then to the cylinder. Radiation
assisted by a tight fitting hood and a forc
draft created by the extra large fan flywhe

The steering is by inclined hand wheel a
crosswise rack operated by pinion dir

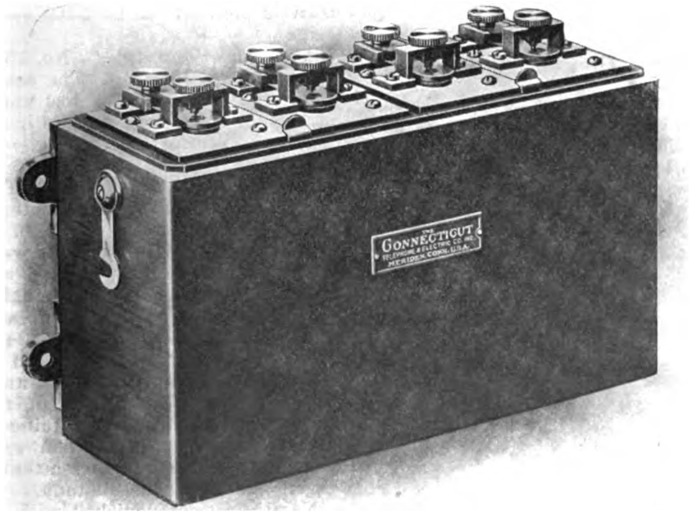
YOU CAN FORGET with a Connecticut Spark Coil

You can put a set of Batteries in your car and run a season without giving them a thought—the most perfect ignition system ever devised.


THE CONNECTICUT TELEPHONE & ELECTRIC CO. INC. MERIDEN, CONN. U.S.A.

Two Cylinder Coil—One Unit removed.

Perfect Unit System—no tools necessary to remove a unit or adjust the vibrator or contact screw—(are self locking). Rain Drip, Great Efficiency, Durability, Simplicity and Beauty are but a few of the qualities possessed by this coil. It holds the world's records for both Durability and Efficiency. While the first cost is a little more they are far cheaper in the long run.


THE CONNECTICUT TELEPHONE & ELECTRIC CO. INC. MERIDEN, CONN. U.S.A.

Four Cylinder Dash Coil—Cover removed.

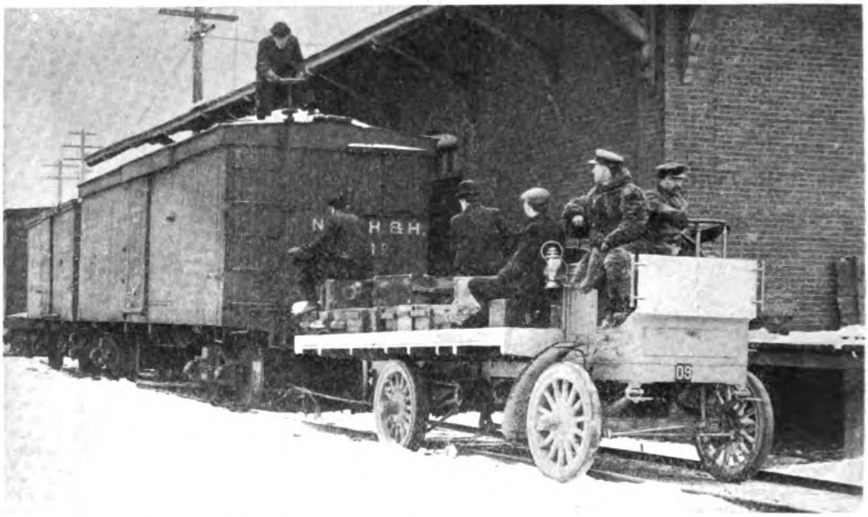
This coil will operate on from ¼ to 1-20 the amount of current used by the average coil, which means from 4 to 20 times the mileage with the same Battery. Think of it and if interested send for catalogue.

THE CONNECTICUT TEL. & ELECTRIC CO., Inc., 30 Britannia St., Meriden, Conn.

through two adjustable ball and socket joints to a lengthened ball end steering knuckle arm. Its action is positive and is perfectly free, as there is no jogging caused by the action of the springs and the usual longitudinal connecting links. The steering column carries the throttle and spark levers directly beneath the steering wheel.

The dash is hollow pressed steel, housing the spark coil and other fittings. The bodies are carefully built in their own factory and are distinctly original, having many improved features. The front seats are individual. The tonneau is wide and roomy and is detachable. The best of leather, hair, cushion springs and other materials go into the upholstering.

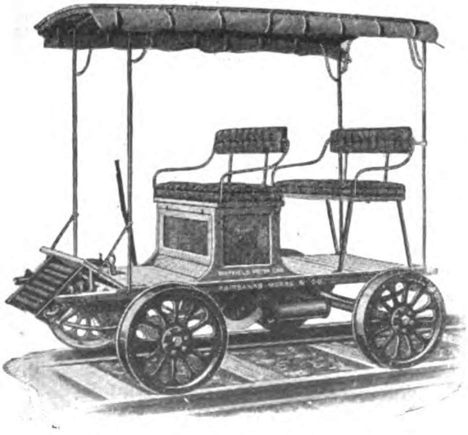
Two gas head lights with generator, two side oil lamps, tail light, dragon horn, and necessary wrenches complete the equipment.



Big Knox air-cooled truck hauling two freight cars; this truck was built by Knox Automobile Co., Springfield, Mass., and recently shipped to Marshal Field & Co., of Chicago. This demonstration of the truck's power was made by employes of the Knox Co. just to satisfy their own curiosity as to the car's pulling ability. The two freight cars weigh 36 tons, but the Knox truck pulled them with ease. As there was snow on the ground, a little sand was sprinkled to give the wheels a grip, but no chain or any attachments were put on the wheels. Withou any difficulty, the truck started up the cars, the tracks being slightly upgrade at this point. It wa afterward discovered that the brakes were partially set on one of the cars.

"Sheffield" Inspection Cars.

Fairbanks, Morse Railway Car Co., Franklin and Monroe Streets, Chicago, Ill., are now putting out a line of gasoline inspection cars which are also largely used by circulation de-



"Sheffield" Inspection Car, No. 15.

partments of newspapers, which are thus made independent of railway schedules.

The Sheffield line of railway cars includes a wide variety of styles. No. 15 is a 2-seated car weighing 1000 lbs. The seats are uphol stered in leather and the steel and wood frame of the car rests on semi-elliptic springs, mak ing very comfortable riding. The 22-inch wheels have wood centres and steel flanged rims. The frame is of steel and wood. Axles are of steel, 1¼ in. in diameter and run on roller bearings, being enclosed in a 2¼-in tube. A trussed brake with wooden shoe is operated by a foot lever.

Power is furnished by a single cylinder, 6 H. P. gasoline motor, jump spark ignited and is transmitted through a 2-speed and re verse, planetary change speed gear. The change speed gear runs in oil and is substan tially constructed. Speeds of from 3 to 30 miles per hour can be obtained. An auto matic force feed lubrication system is em ployed, requiring no other attention than the weekly filling of the oil tank.

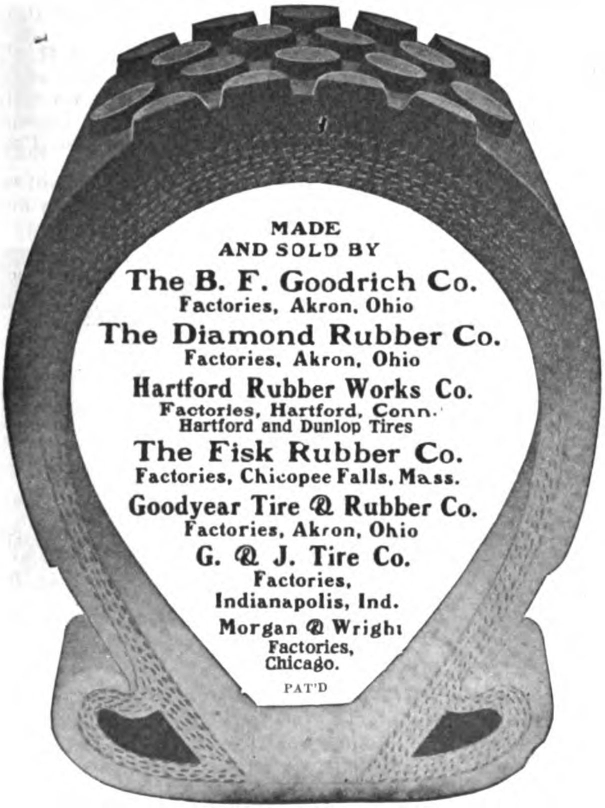
No. 15 is also furnished with one seat and a baggage rail surrounding the rear deck also with a canopy top.

The Eclipse Machine Company, Elmira, N Y., are now prepared to furnish their Morrow Hub Coaster Brakes for either chain or bel driven motor cycles and are doing an excel lent business on the same.

The Pleasure, Safety and Economy of motoring and the Foundation of the Wheel is the Perfect Traction of the Skid-proof Rubber Tread on the

BAILEY "WON'T-SLIP" TIRE

N. B.—The extra cost of Bailey Tires on the LIST more than smooth of same make, is 2½ and 3 inch, $1.50 each; 3½ inch, $2.00 each; 4 inch, $2.50 each; 4½ inch, $3.00 each; 5 inch, $3.75 each.



MADE
AND SOLD BY
The B. F. Goodrich Co.
Factories, Akron, Ohio
The Diamond Rubber Co.
Factories, Akron, Ohio
Hartford Rubber Works Co.
Factories, Hartford, Conn.
Hartford and Dunlop Tires
The Fisk Rubber Co.
Factories, Chicopee Falls, Mass.
Goodyear Tire & Rubber Co.
Factories, Akron, Ohio
G. & J. Tire Co.
Factories,
Indianapolis, Ind.
Morgan & Wright
Factories,
Chicago.
PAT'D

N. B.—Now ready: Bailey's "Won't Slip" tread BANDS for covering all makes and sizes of smooth, new or partly worn tires at nominal cost by Bailey tire manufacturers. Write for prices.

It was the Bailey "WON'T SLIP" tires that carried the REO Car across the continent, and the Reo ten-passenger bus winning the 700 mile economy test of the N. Y. Motor Club, Nov. 4th, 1905, was equipped with the Bailey "Won't Slip" Tires. It was the Bailey "WON'T SLIP" tires on a PIERCE GREAT ARROW that won the 1,000 Mile GLIDDEN TROPHY ENDURANCE TEST. It was the Bailey "WON'T SLIP" tires that carried the PEERLESS CAR to victory in its climb of Mt. Washington. Also in winning the READVILLE and EMPIRE HANDICAP Races. It is the Bailey "WON'T SLIP" tires that every rider should have.

The highest endorsement for them is the fact that seven of the largest tire manufacturers in the country are making and selling them. They are to the Automobile what the Rudder is to the Ship. They prevent SKIDDING and SLEWING, give PERFECT TRACTION on all kinds of surface, and GREATER DURABILITY. They are supplied by all manufacturers, their agents, dealers, and repair men everywhere. Order them on your new car, and **accept no other.** Write us for price booklet. See them at all the Auto Shows.

C. J. BAILEY & CO., **Patentees**

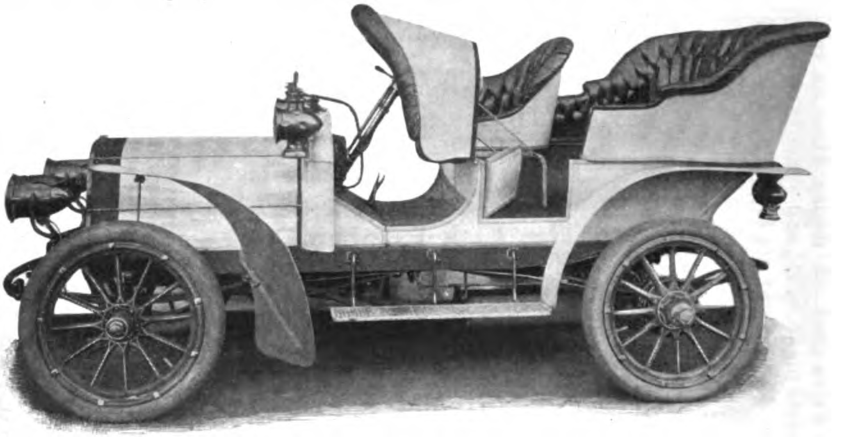
22 Boylston Street **Boston, Mass., U. S. A.**

Duquesne 1906 Air-Cooled Touring Car.

W. J. GRUBE.

The Duquesne Construction Co., Jamestown, N. Y., manufacturers of the Duquesne car, who have just brought out their new 1906 Model Car, decided early this season regarding their policy for 1906, and the 1906 Model has been on the road for several months and has been put to every test by months of hard usage over very rough and hilly roads, and has covered in all about 6,000 miles without a break of any kind. They have about 100 machines nearing completion for early 1906 deliveries.

The Duquesne Company have a model factory, the power of which is supplied by water power from Chautauqua River. The main building is four stories high and has a floor space of about 30,000 square feet. The factory is fitted with the latest machine tools and in addition to their own body-making establishment the Company have their own electric plant and a complete electro-plating establishment. The company is amply financed and the prospects for 1906 are very bright indeed.



Duquesne 16-20 H. P. Car, showing Tilting Front Seat.

The Duquesne Car has no features not approved by modern practice and design, but several conveniences that have to be seen to be appreciated. The first of which is an ingenious starting device operated by foot pedal from the seat, which makes starting so easy a lady can start the motor. This is accomplished by a ratchet on engine shaft operated by steel pawl and foot pedal, which is returned to starting position with coiled spring. This device is exceedingly simple and well made, both ratchet and pawl being accurately cut and hardened and sufficiently strong to do the work. One downward movement suffices to start the motor, and in the writer's presence motor never failed to start. This is very desirable and removes one very objectionable feature.

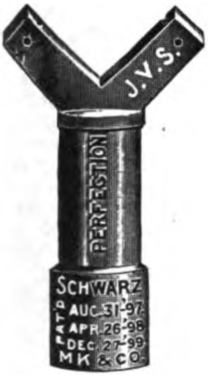
Another nicety of the Duquesne is that the headlights are mounted on trunnions on main frame, and are connected to steering gear so that as the wheels are turned the lights turn in unison with the wheels, which is to be sired, especially in turning a sharp turn high speed.

Another novelty of Duquesne design is body, which is a double side entrance t neau, which is entered by tilting front s forward, which automatically opens tonne door. The Company, however, will fit chas with the usual side entrance body if so sired. The tonneau is exceedingly wide a luxurious and will seat three people comfo ably.

The car has a 16-21 H. P. vertical air-co ed motor, a wheel base of 90 in., 32 in. Sa bury wood wheels fitted with 3½ in. tires (a make, American or Continental, being su plied); weighs 1750 lbs. Price, fully equipp $2,000.00.

THE ENGINE.

The motor is a four-cylinder vertical. T cylinders have a bore of 3½ in., stroke 4 and develop 16-21 H. P. Cylinders are c separately and each have 960 inches of ra ating surface, radiating fins being exceedin deep and thin. Valves are both mechanica operated and arranged in cylinder head, 1⅝ in. diameter and interchangeable; in ad tion, the cylinders are fitted with auxilia exhaust fitted with automatic valves. The c inders are copper plated and oxidized, wh makes a very neat and durable finish, and said to assist in the cooling. The crank c is of aluminum divided in centre and is ea accessible. Cam shaft is entirely inside engine crank case and is operated by st gear on engine shaft and bronze gear on h time shaft. Cams are of large diameter, hardened. Valve lifters are secured fr turning by slotted bronze guide and harde steel pin. Crank shaft is 1½ in. diamet centre bearings 2⅜ in. long; main bearing in. long; 6 in. flange for securing flywh forged integral with crank shaft; an alu num case encloses lower half of flywheel transmission; this is bolted solid to main gine case and to the frame members.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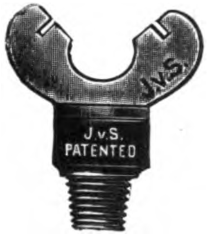
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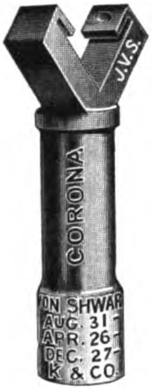
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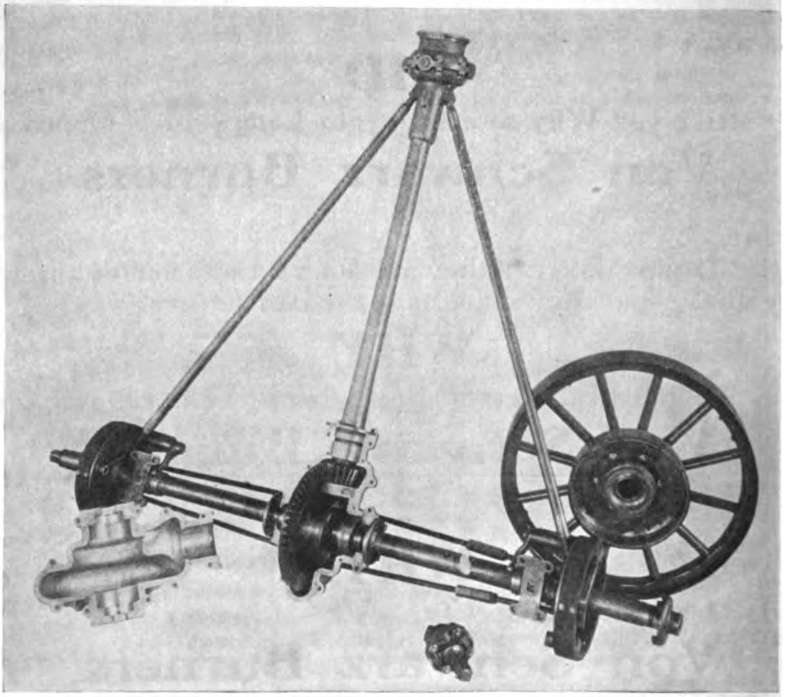
transmission is supported in this case and turns on Hess-Bright ball bearings. This case makes a complete protection for working parts and prevents dust or dirt from reaching any part of the mechanism.

The transmission is of the planetary type, giving two forward speeds and one reverse, and contains only spur gears hardened and running in oil. Direct drive on high speed all gears idle.

Propeller shaft is encased in a tubular torsion lever, which is fixed solid with rear axle; front end of this tube carries universal jointed housing, which is practically dust and dirt proof, stationary part of which is bolted to gear case. Exactly in line with this joint in housing is the universal joint on propeller shaft. The drive gear is cut integral with shaft and electrically welded to propeller shaft, the front one being squared into universal joint, both universal joint and shaft being hardened.



Floating Rear Axle, strut rods and wheel of Duquesne Car.

Rear axle is of the floating type. Wheels, clutch driven, drive clutches being fitted to squared ends of rear axle, which is 1¼ in. diameter, high carbon shaft steel hardened on ends. This axle is also squared into differential, which is of the all spur gear type, and fitted with Brown & Sharpe bevel gear. The differential case is aluminum divided in centre, which allows the differential to be easily removed; also has a removable cap for oiling and inspection. The axle tube is fixed to differential case by flanges, which are electrically welded to axle tube and bolted to case with studs and nuts. The axle is double trussed; radius rods run from the ends of the axle to centre of car at the transmission gear case. The frame is of pressed steel, the engine base being bolted to aluminum transmission case, which also encloses flywheel. This gear case is attached to the frame midway at either side, the front of the engine being bolted to front cross frame member. This arrangement of supporting mechanism allows wheels to be raised a foot at any corner without straining bearings or causing bearings to bind, as was demonstrated in writer's presence. The frame is supported in the rear on full elliptic springs 38 in. long, 1¾ in. wide, 4 leaves, and is fitted with double auxiliary spring bumpers. The springs are very flexible and car rides very comfortable with two passengers, the auxiliary springs taking care of additional load when four or five passengers are carried. The front springs are semi-elliptic, 38 in. long, 1¾ in. wide, 4 leaves.

Front axle is forged solid 1⅜ in. diameter; steering knuckles of LeMoine type. Front wheels run on ⅝ in. ball bearings.

Steering gear is of the irreversible type, worm and sector made of steel and hardened. The steering gear is encased in a steel case that is rigidly fastened to main frame. The steering rods carry ball joints electrically welded to rods.

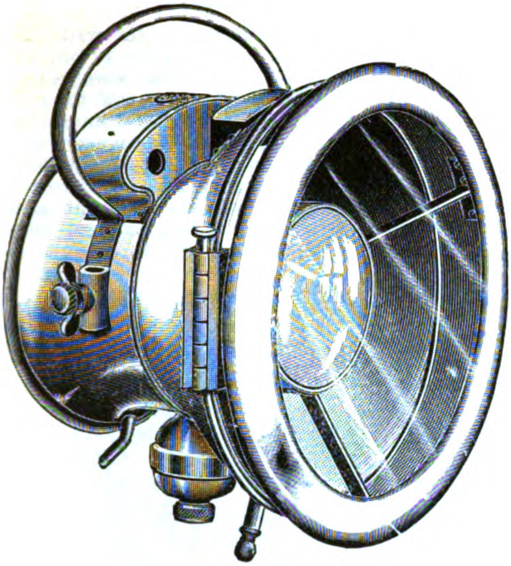
Ignition is supplied by jump spark and dry batteries, a Splitdorf coil being used.

Carburetor is of the usual float feed spray type, and is said to be quite efficient.

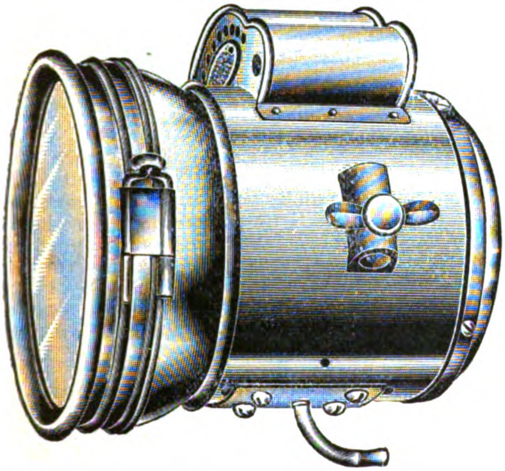
Lubrication is by Hill Precision oiler, positively driven, feeding oil direct to cylinders and main bearings.

Spark and throttle levers are arranged on

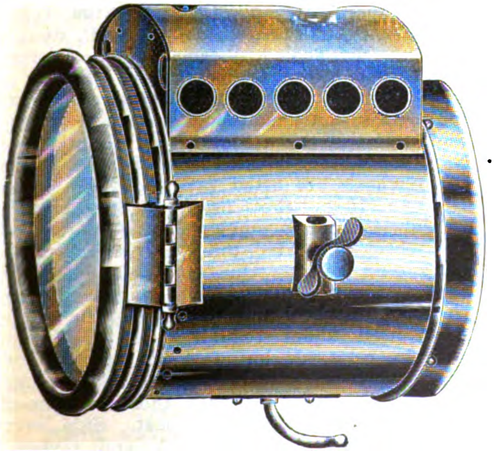
COLUMBIA LAMPS and GENERATORS



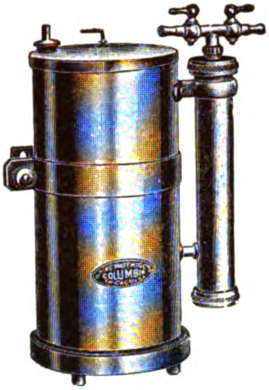
Columbia Parabolens Lamp



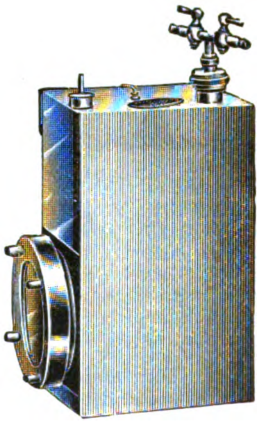
Columbia Flare Opening Lens Mirror Lamps, 1 & 2



Columbia Straight Barrel Lens Mirror Lamp A-B-C-D



Columbia, No. 2 Generator
32 oz. Carbide.



Columbia, No. 2 B Generator
32 oz. Carbide.

Columbia Lamps are made on honor, and are equipped with genuine Bausch & Lomb lens mirrors, hence their efficiency is guaranteed.

Columbia Generators are simple, efficient, easy to control and operate.

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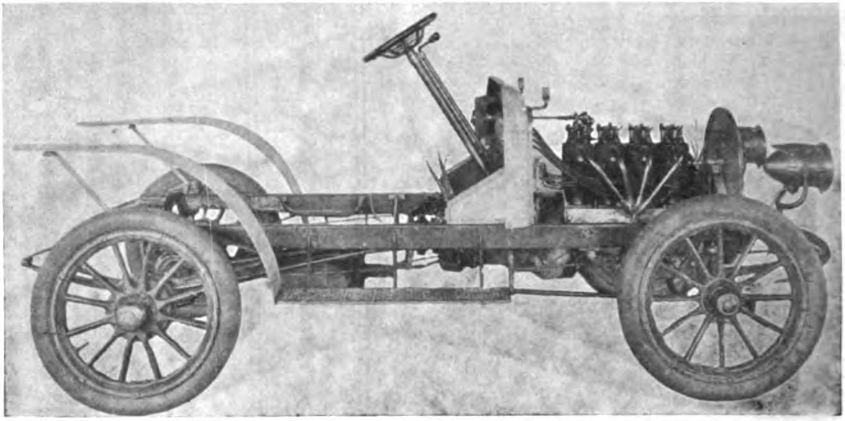
top of steering wheel, but independent of the latter. The gear operating lever is arranged immediately below the wheel. A backward movement of this lever gives the slow speed forward, a forward motion the high speed. The reverse and brakes are operated by foot pedals.

Every part of the Duquesne car is made interchangeable, and great care has been taken with regard to little things—castellated nuts, spring cotters, taper pins used generously throughout.

ON THE ROAD.

On Monday, December 4th, the writer hac the opportunity of taking quite a long rid in the Duquesne. The roads were coverec with about four inches of snow, and the roads in Chatauqua county and around Jamestowr are exceedingly hilly and in places very rough On one very long and exceedingly stiff hill i was necessary to change gears and run fo quite a distance on low gear, but the moto showed no signs of overheating, and pullec the hill at a satisfactory speed.



Side View, Duquesne Chassis

DUQUESNE RATCHET BRAKE

In addition to the expanding brakes the Duquesne car is fitted with a ratchet brake to prevent car from running backwards should the motor be stopped for any reason. The ratchet is cast integral with brake drum. A forged I steel pawl is brought into engagement with this ratchet by foot pedal and spring and when ratchet is set it is is impossible for car to run backwards.

The Knox Motor Truck Co., Springfield, Mass., have sold two of their powerful three-ton Atlas trucks to the Springfield Provision Co., one to Meekins, Packard & Wheat, and one to E. B. Eddy Co., Hull, Canada. One of their 1906 models, a three-ton Atlas truck, was recently delivered to the Springfield Gas Light Co., and is claimed to be the first gasoline truck placed in that city. These orders were secured after the most rigid tests of the efficiency of Atlas trucks. The Knox Motor Truck Co. will be ready March 1 to make deliveries of their new Model C, 3000 lb. delivery wagon, which will be equipped with a Libby two-cycle, vertical, two-cylinder 25 H. P. motor developed on the Pacific coast and thoroughly tested during the past two years.

Croesus Motor Car Company, Kansas City, Mo., will offer two models of pleasure automobiles for the 1906 season. Model A has a 4-cylinder, 30-40 H. P. engine, 104 in. wheel base, 34x4½ in. Continental tires, and two sets of ignition, comprising a Lacoste magneto coil and storage battery. It is shaft driven with a sliding gear transmission, and silver plated trimmings throughout. Model

The motor ran exceedingly smooth an without perceptible vibration and pulled th car loaded with five passengers up some c the steepest hills the writer has ever seen motor car climb. The car was stopped c the steepest of these and held from runnin backwards, to show the efficiency of th ratchet brake. The motor was then starte by foot pedal without dismounting, and th car continued the ascent.

B is a 4-cylinder, shaft driven runabout wit sliding gear transmission; an 82-inch whee base, 30x3½ in. tires and a fine equipment.

The Average Man's Runabout

The "Average Man's" runabout, put out b The Adams Automobile Co., Hiawatha, Kas for 1906 is equipped with a 10 H. P. doub opposed, air cooled, 2-cycle motor, locate under hood, and placed crosswise. Power transmitted through knuckle joints and sha to a friction transmission and then to th rear axle through a single roller chain. Th body is of the latest runabout type. Th wood wheels are fitted with 2½x28-in. tire It has a 76-in. wheel base and 50-in. trea Wheel steering is employed, and on top the wheel is located the spark and thrott controlling levers. One foot pedal operate the emergency brakes, while another applie the friction wheel and also applies the brak most used under regular conditions whe entirely released, but releases its grip c brake when pressure is again applied. Whe held at any point between those mentione the machine is allowed to coast. Side leve gives different speeds ahead, and revers Price is $400.00.

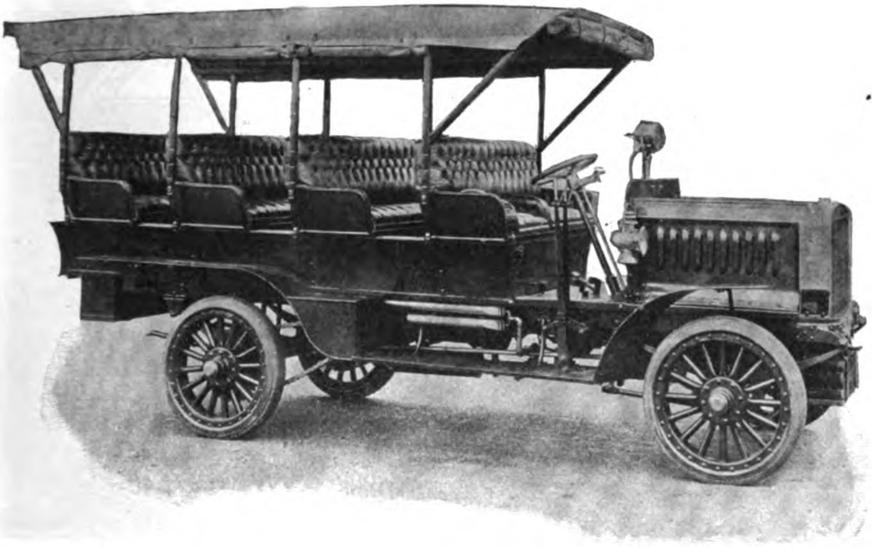
Iroquois Motor Stages.

W. J. GRUBB.

The Iroquois Iron Works, 178 Walden Ave., Buffalo, N. Y., have completed a 60 H. P. stage, which they have put through the hardest and most exacting of road tests. The company have endeavored to design a wagon that would meet the transportation problem from one town to another in districts where electric railroads are impractical and for hotels and resort places for sight-seeing parties, etc. The one aim being to build the machine good enough to travel over any kind of roads and with power enough to go anywhere that four horses would pull a wagon. Their first car was shipped to Utah, where it was tested out and taken over roads that were almost impassable for horses and wagon. This car was run over the Price trail between Vernal and Ft. Du Chesne, Utah, a distance of 28 miles, through the canons, over the mountains and across the desert. The car was in charge of Mr. W. G. King, Gen'l Mgr. of the Iroquois Iron Works, and a party of six others. They carried an extra 50 gallon tank of gasoline, and had a surveyor's level and barometer along, and all grades were accurately computed. This trail is about 6000 feet above sea level. In many places grades exceed 22 per cent. and for five miles in one stretch sand 9 inches deep was encountered, and in other places ruts were so deep that the front axle dragged the ground. On arrival at Ft. Du Chesne, the Quartermaster Sergeant could not believe that the car had come safely over the Price trail as he said he never brought an army wagon over without something being broken. The only thing that went wrong on the car after being subjected to as hard a test as any ever given a motor car, was that the right hand front mud guard was broken. This test demonstrated the fact that a properly constructed four wheel wagon could be made strong enough to give satisfactory service under the worst conditions. This wagon is now in operation daily between Dragon and Bonaza, Utah, a distance of 24 miles and makes the trip in two hours. It formerly required four hours to make the trip with a four horse stage which the motor bus has now supplanted.

The performance of this first car has been very satisfactory, and the Iroquois Iron Works are making active preparations to build a number of these chassis along the same lines, but will finish body, and gear the machine either for passenger service or for truck use for heavy hauling, as purchaser may desire.

This wagon has a wheel base of 11 feet, a tread of 64 inches, 36 inch wheels with 5 inch solid tires in rear and 4½ inch front. The Turner tire made by Hartford Rubber Works being used.



Iroquois 60 H. P. 15-passenger Motor Bus.

The frame is of steel channel section 5 inches deep by 1¾ x 3-16 thick, and is endless, cross frame members of the same section and are securely braced by gussett plates. Springs both front and rear are semi-elliptic, 45 inches long, 2¼ inches wide and have 13 leaves.

MOTOR.

The motor is a 60 H. P. four cylinder vertical water cooled. Cylinders are cast separate, with head, valve chambers and water jacket integral. The cylinders have a bore and stroke of 6 inches respectively. Valves are mechanically operated 2⅜ diameter, and are interchangeable. The crank shaft is of Carpenter steel 2 inches diameter, and is carried in five bearings which are held with the upper half of the crank case. The main bearings are 6 inches long, central bearings are 3¼ inches long. The disc for fastening flywheel is forged integral with the crank shaft. The flywheel being secured by tool steel dowells and bolts.

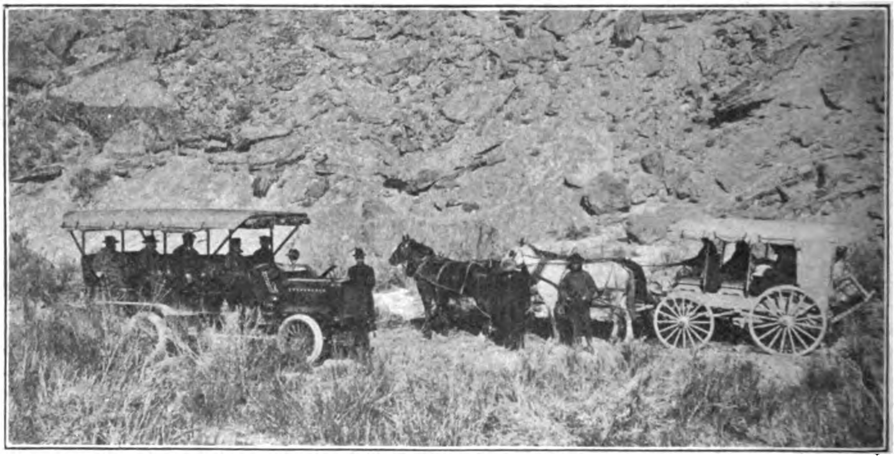
The crank case is of aluminum divided in the center, cam shafts are on the inside of crank case, and are driven by combination bronze and fibre gears. Cams are case hardened and secured to shaft by Woodruff Keys and set screws, valve guides are of bronze. Cylinders are finished by grinding. Piston is of generous length and carries four packing rings. The piston pin is 2 inches in diameter of nickle steel hardened. The piston pin is hollow and is secured in place by set screws which register with holes in pin. The connecting rods are cast of Whitley Steel, piston pin end is solid, bushed with hard bronze. The crank pin bearing is adjustable The rod bronze bushed. The cap is of solid bronze.

Transmission gives three speeds forward and one reverse and is of the usual sliding gear type; gears are 1⅝ inch face, 6 pitch of nickel crome steel, carefully hardened and ground to gauge after being hardened. The bearings throughout the transmission are roller, with the exception of the end thrust bearings which are ball and are of large diameter. The sliding train slides on squared and hardened shaft. The clutch is of the usual cone leather faced type, but the Company are now experimenting with a multiple disc clutch running in oil, which they think will be much superior, especially for mountain work.

The counter or drive shaft is 1⅞ inches in diameter, carried on four roller bearings, two in the transmission, and two on main frame, held in place by bronze castings. Radius rods 1⅜ inches in diameter run from these bronze castings to the rear axle. These are tightened in the usual manner with right and left turn buckle. The final drive is by double chain. Whitney chains 1½ inch pitch by ¾ inch wide being used.

The front axle is of steel 2¼ inches square steering yokes forged integral, steering axles taper from 2⅛ inches to 1½ inches, front wheels roll on Timken roller bearings. Rear axle is of the same size with the same type of bearings.

Steering gear is of the usual worm and sector type with all wearing surfaces hardened.



The Iroquois Bus in Utah and the stage which it has supplanted.

The cooling is accomplished with a Briscoe coil pipe radiator, positively geared circulating pump, and by belt driven fan, and additional radiator being hung below the hood. The cooling is very efficient. The carburetor used is the Buffalo. This carburetor is of the usual float feed type, but the gas and air throttle are linked together by a peculiar mechanical motion which is said to vary the position of the air throttle in exact proportion to the needs of the engine.

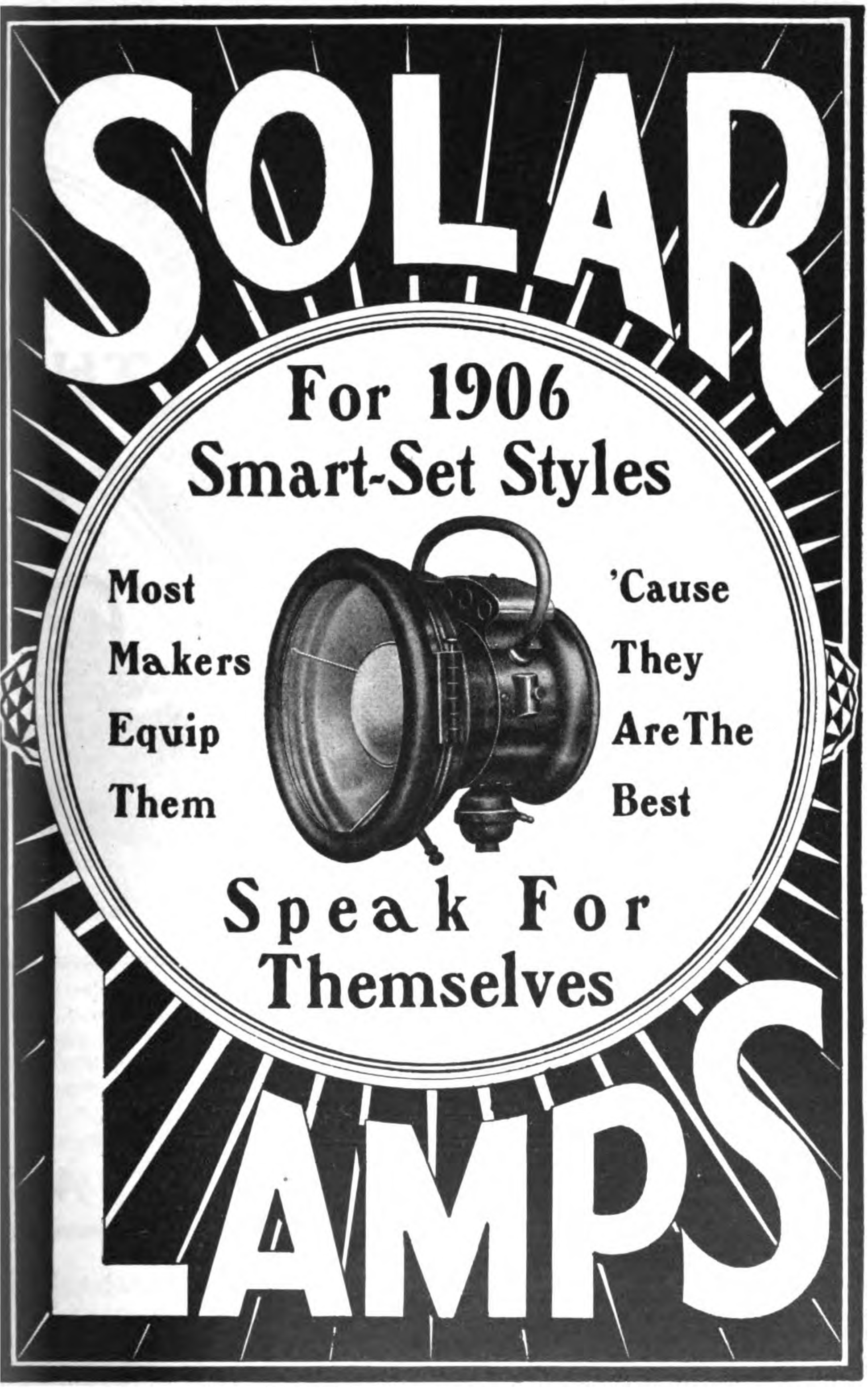
The ignition is by jump spark. A Remy Type H. magneto supplies the current. This is mounted on an extention cast integral with the crank case.

The lubrication is by Hill Precision oiler, feeding oil direct to cylinders and crank case. The oiler is positively geared and is very economical in operation.

The car is fitted with three brakes, a service brake on drive shaft, and two powerful outside clamp band brakes on the rear wheels. These are 15 inches in diameter and 2 inches wide, and will hold the car anywhere.

The spark and throttle levers are mounted on sector, immediately below steering wheel. All gear shifts are on one lever. An interlocking device prevents gear changes unless the clutch is disengaged. Emergency brakes are set by lever and secured by ratchet. The left hand foot pedal operates clutch. The right hand pedal applies service brake on the drive shaft.

This car when geared for passenger work has a speed of 18 miles per hour on direct drive, and will seat 15 people comfortably. The cushions are very deep and have the springs placed very close together and the car rides very comfortably, almost as easy in fact as when pneumatic tires are used. The Iroquois Works have made no fixed price on this wagon, as this of course will depend on the equipment, style of body, and the use for which it is intended, but invite correspondence from parties interested in this type of vehicle.



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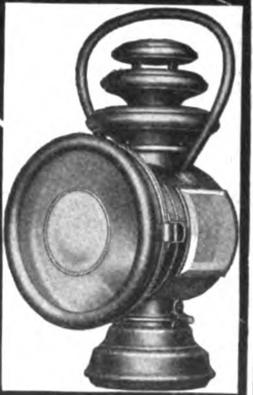

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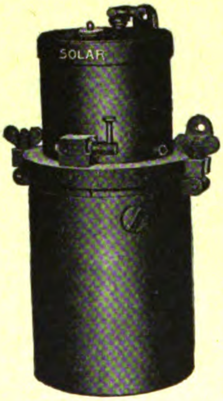

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Leaks are
Impossible

Better than the 1905
Which was Best
Made

LAMPS

The Lambert, 1906 Line of Automobiles

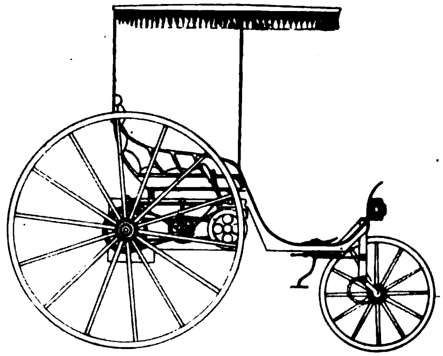
HUGH DOLNAR.

In 1875 George Lambert, farmer, promised s son John, 15 years old, to take him to a nnery next day to see an engine that ran thout a boiler. The lad's disappointment as great on arriving at the place next mor- ng to find that the tannery had burned wn the night before, but he appeased his riosity somewhat by closely examining the rned otto gas engine in the ruins, the only e he had ever seen or heard of. The gas gine lingered in John Lambert's mind, and made many plans for both steam and gas gine driven wagons, and finally early in 91 began the construction of a three cylin- r gasoline car, by having drawings made in eveland by one William Watcholds, a Ger- an architectural draughtsman. Blue print re reproduced.

The motor was three horizontal 4-cycle ater-cooled cylinders, 3x4 ins.; two chains a counter shaft; friction clutch selection, th chain to solid axle, and sleeve with lance gear; two speeds forward, no reverse, cycle, the single front wheel being steered a double foot-tiller. A hand tiller was ded to the car, after it was on the road. ne car weighed 585 pounds; had wooden neels and steel tires; was on the road in 02; ran well and was considered a great ccess. This car cost John Lambert $3200 sh, and he declined an offer of $1000 for

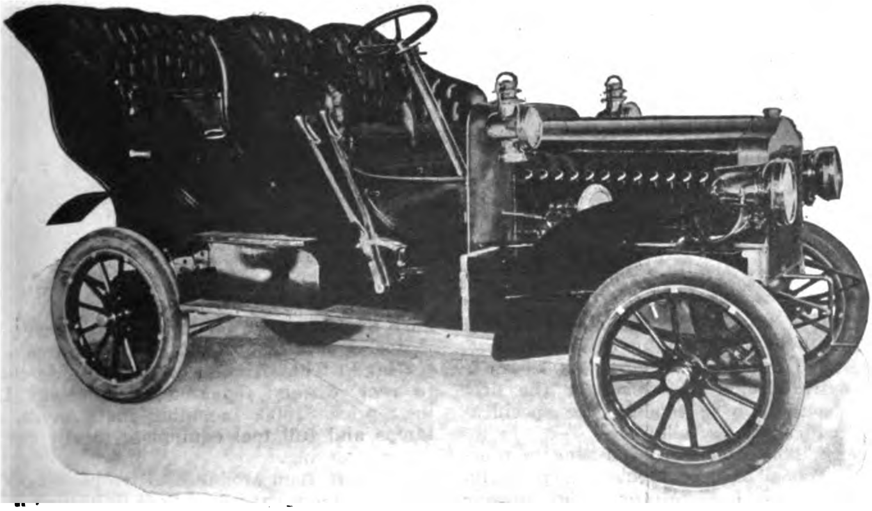
The carburetor was a surface vaporizer, th a flexible diaphragm "compensator" tented to John W. Lambert May 17, 1902; pe spark ignition, dry cell batteries. This r motor was destroyed by the burning of a ilding where John Lambert was applying me improvements in 1904. Excepting the otor, this car, one of the very first of Amer- n gas engine driven wagons, and per- ps at that time of inception, the most ad- nced gas engine driven car designed by an merican, is now in the possession of its originator, who intends to reproduce it exactly as first constructed.

Car building was not at once begun by John Lambert, who, with his brother and father, began building gas engines in 1893, as the Buckeye Mfg. Company, the product of which is now handled by the Lambert Gas & Gasoline Engine Company, same stockholders, factory at Anderson, Indiana, U. S. A. Over 6300 Lambert Gas Engines have been made and sold up to the date of this writing, Dec. 14, 1905.



John W. Lambert's first gas engine motor car construction drawing, date March 29, 1891. Motor, three horizontal cylinders side by side, chains to cross shaft, friction selection, two speeds forward, no reverse. Tricycle, rear wheels 48 in., front wheel 24 in., steel tires, 2 passengers. On the road in 1892; weight 585 lbs.; cost John W. Lambert $3200 cash; offered at $1000; not sold.

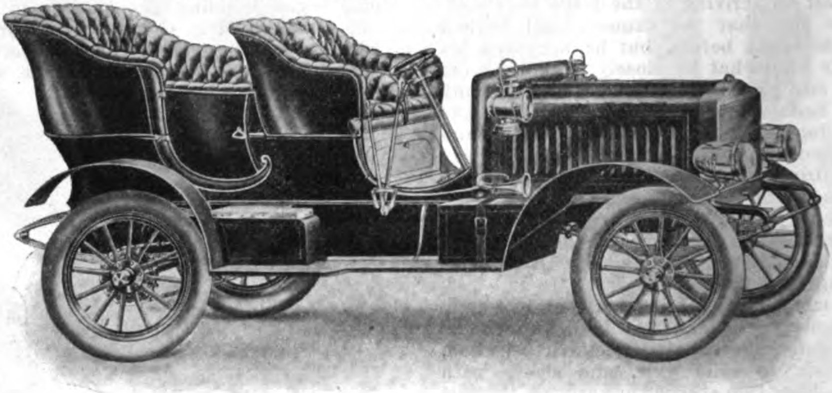
John Lambert had the motor wagon in mind all these years and began the present line of Lambert Automobiles by having drawings of a friction driven car made in 1897, side chains to the rear drivers, single cylinder 6x7 ins., nominal 3 H. P., in those days actual H. P., about 4 H. P. at 200 R. P. M.



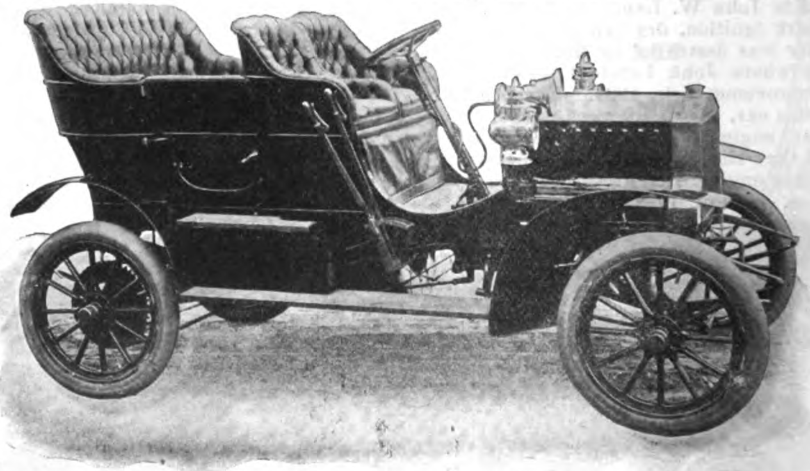
Lambert 1906 Model 8, 5 passenger touring car; wheel base 98 in.; gauge 56 in.; wheels 34x4½ in.; motor four 4-cycle water-cooled vertical cylinders, tandem, 4½x5 in.; friction disk drive, side chains to rear wheels; weight 2200 lbs.; price $3000, including mats, horn, five lamps and generator, a Jones speedometer and a full tool equipment ready for extended touring; side doors to tonneau, and also side doors to driver's seat.

fast as the valve actions of those days would run, compression about 45 pounds.

The first friction driven car, as designed by John Lambert, was on the road in 1900; this car was produced by a third corporation, known as the Union Automobile Company of Union City, Indiana. The motor was a pair of opposed 6x4 ins. cylinders, far in front, crosswise, side chains to rear drivers. This was quickly followed by a second friction driven model, same motor placed crosswise in extreme rear of car. Over three hundred of the "Union" cars have been made and sold, giving good satisfaction.



Lambert 1906 Model 7. Wheels 32x4, otherwise same chassis as Model 8; 5 passengers, detachable tonneau, no doors to driver's seat; weight 2000 pounds; price $2000, including mats, horn, five lamps and full tool equipment, all ready for extended touring.



Lambert 1906 Model 5, 5 passenger detachable tonneau; wheel base 94 in., gauge 56 in., wheels 30x 3½ in.; motor a pair of opposed cylinders 6x4, set far in front, friction drive, side chains to rear wheels; weight 1800 lbs.; price $1200, including mats, horn, oil side lamps and tools.

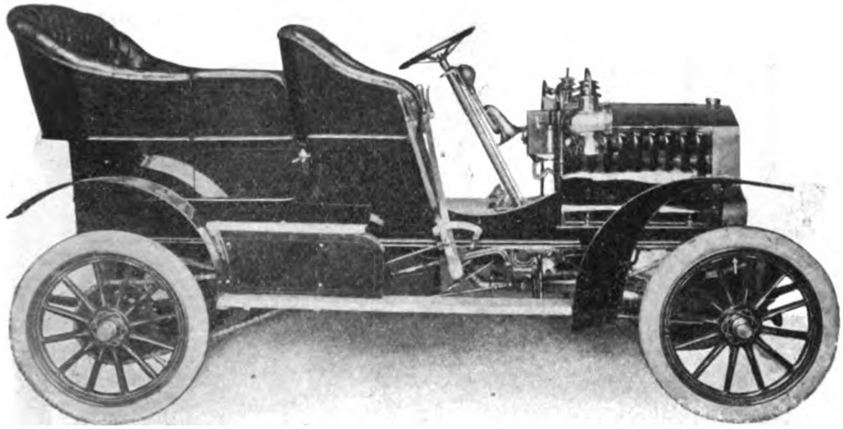
The first Lambert Automobile was sold June 1st, 1905, a design by John Lambert, and the 1906 line of "Lambert" 1906 cars is here illustrated and described for the first time; it consists of 8 models, the specifications of which are as follows:—

Lambert 1906 Model 8, 5 passengers touring car. Wheel base 98 inches, gauge 56 in. Wheels 34x4½ in. Motor four 4-cycle water-cooled vertical cylinders, tandem, 4 ½x5 ins., friction disk drive, side chains to rear wheels. Weight 2200 lbs. Price $3000, including mats, horn, 5 lamps and generator, a Jones Speedometer, and a full tool equipment ready for extended touring. Side doors to tonneau, and also side doors to driver's seat.

Lambert 1906 Model 7. Wheels 32x4, otherwise same chassis as Model 8, 5 passengers, detachable tonneau, no doors to driver's seat. Weight, 2000 lbs. Price, $2000, including mats, horn, 5 lamps, and full tool equipment, all ready for extended touring.

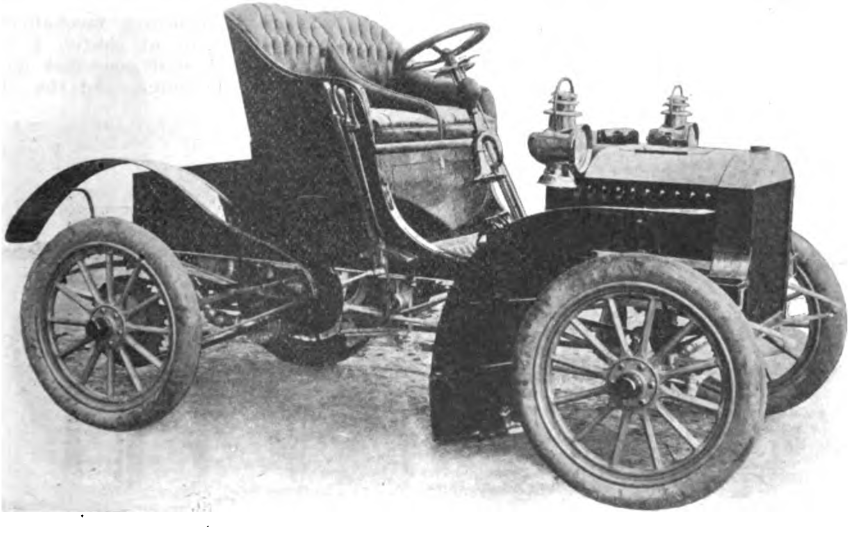
Lambert 1906 Model 6 is a side entrance touring car, same body as Model 7; wheel base 94 in.; gauge 56 in.; wheels 30x3½ in.; motor, a pair of opposed cylinders, 6x4½ in., set far in front friction drive, and side chains to rear wheels; 5-passengers; weight 190 lbs.; price $1500, including mats, horn, fiv lamps and full tool equipment, ready for extended touring.

Lambert 1906 Model 5. Five passenger detachable tonneau; wheel base 94 in.; gauge 5 in.; wheels 30x3½ in.; motor, a pair of opposed cylinders 6x4, set far in front; friction drive, side chains to rear wheels; weight 180 bs.; price $1200, including mats, horn, oil, ide lamps and tools.



Lambert 1906 Model 4. Detachable tonneau, 5 passengers, same chassis as Model 5; weight 1800 pounds; price $1050, including mats, horn, two oil lamps and tools.

Lambert 1906 Model 4. Detachable tonneau, 5 passengers; same chassis as Model 5; veight 1800 pounds; price $1050, including ats, horn, two oil lamps and tools.



Lambert 1906 Model A runabout. Wheel base 78 in., gauge 56 in., wheels 30x3½ in. Motor a pair of 6x4 cylinders opposed, set over the rear axle, friction disk drive, side chains to rear wheels; weight 1600 pounds; price $900, including mats, horn, two oil lamps and tools.

Lambert 1906 Model A Runabout; wheel ase 78 in.; gauge 56 in.; wheels 30x3½; otor, a pair of 6x4 cylinders opposed, set ver the rear axle; friction disk drive, side hains to rear wheeds; weight 1600 pounds; rice $900, including mats, horn, two oil amps and tools.

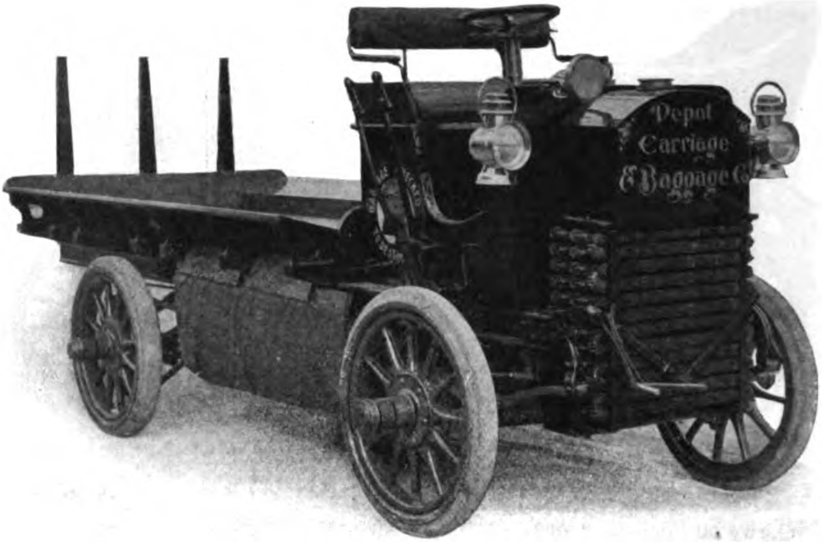
Lambert 1906 Model A Truck; paying load 000 lbs.; wheel base 96 in.; gauge 56 in.; heels 32x4 rear, and 32x3½ in. front; solid Firestone" tires; motor underneath, in rear f driver's seat, a pair of horizontal opposed ylinders, 5½x6 in., friction drive, side chains o rear wheels; weight 3000 pounds; price 2000, with driver's seat and cushion, two oil lamps and tools. The driver's hood and truck platform to suit business are extra.

Model B Truck, Lambert 1906, carries a paying load of 1500 pounds, and has cylinders 6x4½ ins., otherwise same construction as Model A truck, weight of Model B Lambert Truck 2400 pounds, price $1500.00, same equipment as Model A Truck.

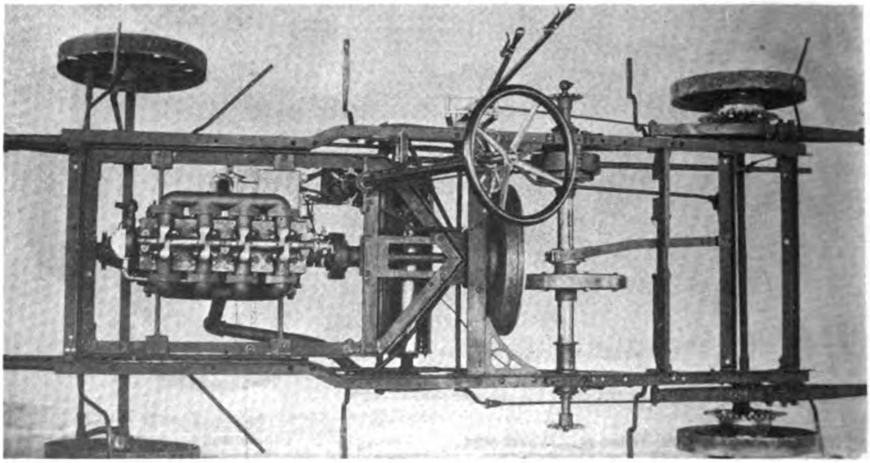
LAMBERT FRICTION SPEED CHANGE AND DRIVE.

The distinctive feature of the Lambert cars is, of course, the friction disk drive. John W. Lambert took up the friction disk and traversing pinion drive in 1900. The first attempt with a leather faced disk and gray iron friction wheel, 18 in. diameter x 1½ ins. face. The leather was charred in the first three miles run. The disk was then faced with wood fiber, ½ in. thick. This material has a glossy surface, and drove well until the outer skin broke up at the end of 200 or 300 miles run, when it was at once destroyed. Various experiments followed. A plain gray iron disk and strawboard faced traversing friction wheel, giving the best results, not quite enough to be sure about, and not quite bad enough to definitely abandon. In the course of these trials a cone of cast aluminum was used as one member of a level friction drive, and showed surprisingly good results, though the material, aluminum was not at that time credited with the benefit. Later, it occurs to John W. Lambert that possibly the pull was due to the aluminum itself, and a disk was faced with aluminum, and tried with the strawboard traversing wheel, an the troubles ended as if by magic. The fric tion drive drove at last, and drove ever thing perfectly. Patent was at once applie for, and was issued to John W. Lamber May, 1904, No. 761,384, the first claim follows:

"In a power transmitting mechanism, th combination of a pair of shafts, a frictio disk carried by each shaft, one disk having bearing part of aluminum, and the other fiber part bearing on the aluminum par This patent carries 6 claims, and it is o with frictions having this patented combi tion of aluminum and fibrous working fa

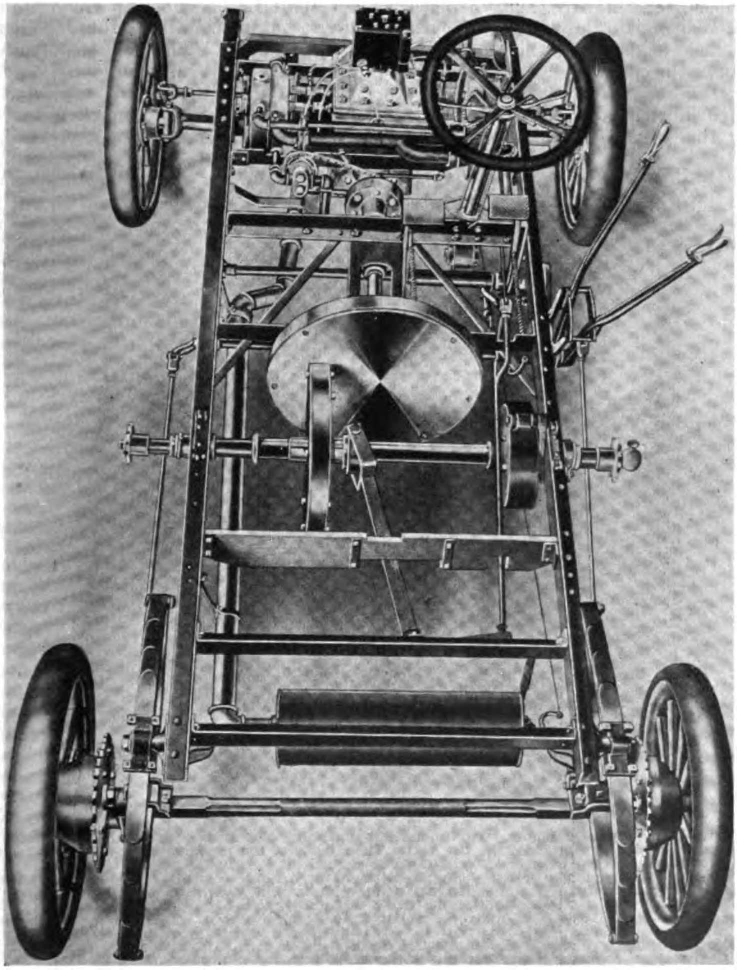


Lambert 1906 Model A truck. Paying load 3000 bs.; wheel base 96 in.; gauge 56 in.; wheels 32x4 rear. and 32x3½ in. front, solid "Firestone" tires; motor underneath, in rear of driver's seat, a pair of horizontal opposed cylinders, 5½x6 in., friction drive, side chains to rear wheels; weight 3000 pounds; price $2000, with driver's seat and cushion, two oil lamps and tools. The driver's hood and truck platform to suit business are extra.



Lambert Models 7 and 8 chassis plan. The wheels and axles of all Lambert cars are carried on Timken roller bearings. The motor, 4 cylinders, is carried on a sub-frame, supported forward on the front springs, and at the rear globe-journaled to the chassin frame cross-girt. The chassis frame is supported behind on the rear axle springs, and in front is journaled at the middle of the front cross member to the motor sub-frame. This three-point suspension appears only in Models 7 and 8 of the Lambert cars. The disk-shaft, which an extension driven by a three solid jawed clutch from the crank shaft is carried in two roller bearings. The motor base supporting arms are steel castings. The Lambert chassis frames are all angle steel constructions, no pressed steel frames being used.

that Lambert cars have been more successful than other cars which have failed in attempts at friction driving, and its is safe to say that but for the accidental discovery of this combination, the Lambert cars would not now be friction disk and traversing wheel driven.



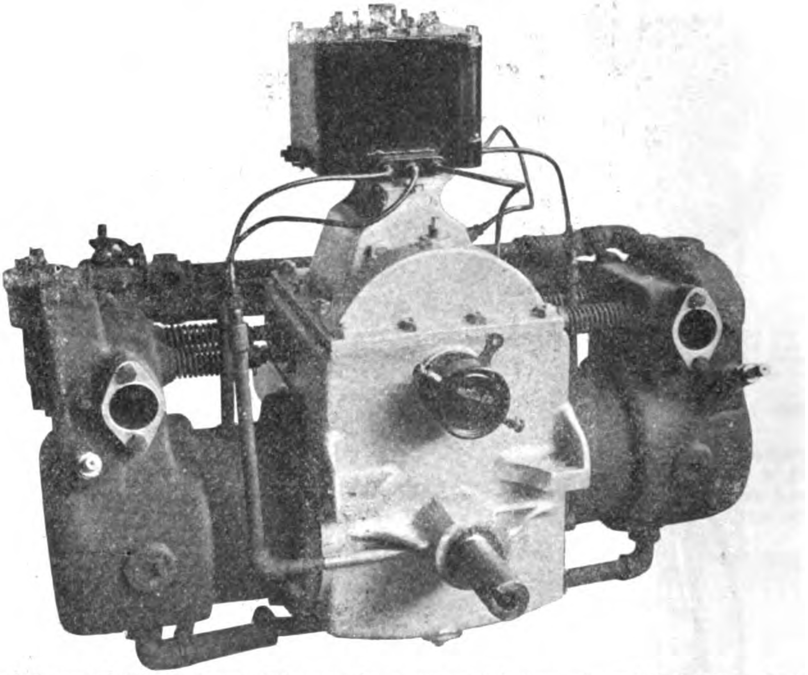
Lambert 2-cylinder chassis, Models 4, 5 and 6, Model 6 having a larger motor, but otherwise the same. This illustration shows admirable the Lambert Friction Disk speed change. The grey iron disk, 22 in. dia., is faced with an aluminum disk of equal size, 5-16 of an inch or so in thickness. The traversing wheel is 18 in. dia. by 1½ in. working face, straw-board rings 18 in. out dia. by 3 in. radial dimension, being clamped between cast iron members supporting the straw board rings inside and clamping them sidewise. This fibrous friction wheel is splined to slide on a sleeve 17⅛ in. dia. revolubly carried on a steel shaft 13 in. dia., journaled in swinging boxes so that the wheel can be pressed against or separated from the grey iron, aluminum-faced driving disk, which is motor driven.

The Lambert cars are of various models, motors and prices, the two cylinder opposed motor being set crosswise, both in front and rear, and the 4 cylinder tandem motor being placed in the most costly Lambert car, but in all the drive is friction disk speed change and side chains to rear driving wheels. Models 7 and 8 use three point suspension. The other models are of ordinary form.

This drive is, as is well known, of the utmost simplicity, the wheel being driven faster as it is moved outward across the disk, and changing direction of rotation when it crosses the disk center. A great many motor wagon constructors have endeavored to apply this mechanical movement to motor car driving, few of whom have reached a recognized success. It is not impossible in view of the satisfactory results, shown in these cars, that other materials than those patented to Lambert may make a good friction drive for cars, but so far this possibility remains to be demonstrated.

The friction wheel has about ⅝ of an inch of strawboard projecting beyond the metal sides, and the paper faced wheels are expected to drive a car about 2000 miles before wearing the paper down to the metal, then, at a cost to the user of $2.50, a new paper friction part is furnished by the Lambert Company, renewal being applied by an unskilled person quickly, easily and well.

The speed change action is simply a large



Lambert opposed cylinder motor. This motor has a number of features not usual in this form of gas engine, some of which are specified in the text. The oiler is of the precision variety, in which a ratchet actuated worm drives a worm gear carrying spring actuated oil force pump successively over the oil leads to be supplied, the plunge spring being compressed by a circle of wedges, and the rise from each compression being regulated by an individual temper screw. Oil leads drop oil on the crank wrist rod ends. The cranks have full disk arms, and the crank shaft journals run in bronze bearings. The rods have hinged caps on the wristends, and are babbitted with nickel babbitt. The piston ends of the steel drop forged rods have bronze bushes forced in place and pinned against rotation. The piston pins are of large diameter for the cylinder bore, are steel, hardened and ground. The pistons are cylindrical, free fit in the cylinders, and have three rings at the head end, 45 deg. lap, pinned to pistons. The cylinders are chucked on the face plate, bored with single point tools, and are then ground with an overhung emery wheel, cooled with a large stream of water. The rod caps are held open by strong coiled springs, which shut entirely into the chambered caps, into which the cap screw is threaded, and retained by a nut and split pin, the spring taking the place of liners.

steel bell clank, forked and carrying a U-shaped shoe to engage the grooved hub on the driving wheel at one end, and having the other end linked to the speed change and reversing lever. The wheel slides freely on the sleeve, when moved away from the disk, and all speeds can be had in either direction, highest to lowest both ways.

The Lambert drive is always side chains to rear wheels, a balance gear being, of course, used to connect the splined sleeve on which the wheel slides and the steel shaft, which supports the sleeve. The whole Lambert drive is too simple and obvious to require detailed destription, the full illustrations telling the whole story, except that of car performance, which is given in the final "On the Road" section of this article.

Three point suspension saves driving power by decreasing the mass lift in passing road surface variations, and also saves wear and tear of running parts and of car bodies.

The Lambert 2-clinder motor chassis, as shown, is used in models 4, 5 and 6, the last having a smaller engine, but precisely the same otherwise.

A different design from that of any other Lambert cars is shown in the side view of Lambert 1906 Runabout Chassis.

THE LAMBERT VALVE ACTION.

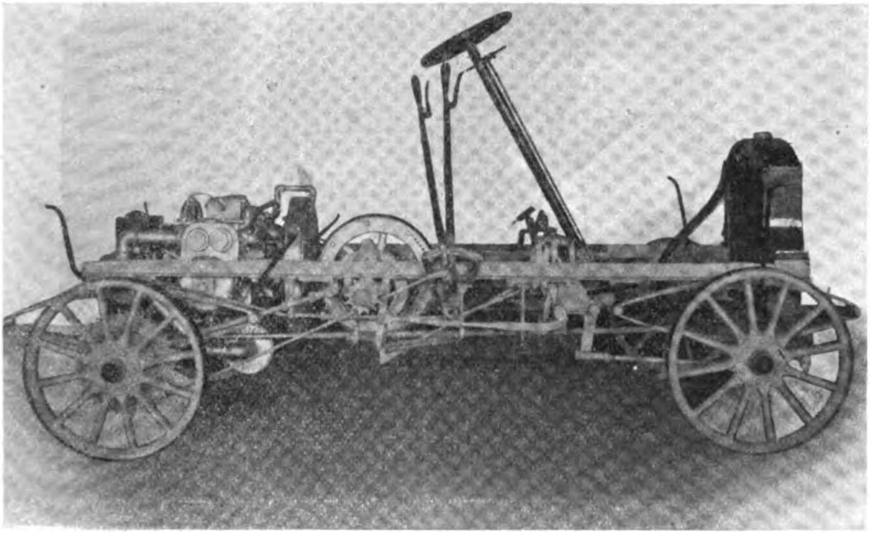
The hardened steel cams are applied to the cam shaft, retained with long driven keys only. The cam faces are slightly convex and work on hardened rollers, carried i swinging forks, which bear against squar ended sliders. The valves have gray iro heads driven to shoulder on rivetted ste stems, ends hardened. The valve action i direct, no side action on the sliders, and al parts of the Lambert opposed motors are o ample strength. The compression is 50 t 55 lbs. Lambert's experiments are agains high compression and air cooling and tw cycle motors. The workmanship of thes motors is good, of course.

The Lambert cars are a good, strong, wel built job throughout, marked by strong indi viduality of design, with a marked inclinatio towards simplicity, and what may be terme common sense engineering everywhere in ev dence. While the Lambert cars are well fi ished and of fine appearance, they show conspicuous avoidance of needless parts an purely academic refinements of design. The are made to give a large capacity for usef effort for the price fixed and to run fast an far and all the time. That they can d what they are built to do, friction drive an all is fully proved by the following story o actual work.

ON THE ROAD.

If there was one single thing that Hug Dolnar was sure of when he first took h seat in a "Lambert" car, it was that th friction drive was not a good thing because it was not mechanically correct, for the reason that the friction disk traversed by a friction wheel on an axis at right angles to that of the disk, must be true to its name, and cannot be a "rolling" drive, because the driven wheel must have some width of face and so must slip instead of rolling as it turns.

Knowing this slipping to be wholly unavoidable, and being aware of many costly failures in attempting to apply the friction-disk and traversing-wheel to car-driving, it seemed to the writer that whatever he saw at the Lambert shops, or of the work of the "Lambert" friction-driven cars on the road, would leave him sure in his own mind that the friction-and so could never have a permanent place in motor car construction. drive in the variable-speed form was bad, generally, and could never be made good.



Lambert Model A runabout, chassis side, motor placed in rear. This is the lowest cost placing of a pair of opposed cylinder motor, is also the most accessible motor location and also places the most weight on the drivers, and is therefore an extremely suitable design for a light low-priced car, and these weighty considerations lead to the retention of this form for the smallest, lightest and lowest priced Lambert car, although it is a marked variation from their other 2-cylinder driven car designs.

The disk and traversing wheel or pinion do have wasteful friction. The driven member has a wide face in the "Lambert" construction, 1¾ ins. wide the wheel face is, consequently the disk travels about 11 inches more past the outer edge of the wheel in every disk revolution than it travels past the inner edge of the wheel. If the wheel is set with its inner edge at the disk center there is no disk travel past his inner wheel-edge, and in each revolution of the disk nearly 11 inches of disk surface must pass the outer edge of the 1¾ in. wide wheel face. This 11 inches of travel difference is constant, because $1\frac{3}{4}\times2\times3.1416=11$ nearly, but as the wheel is moved outward from the center of the disk the ratio of the disk velocities past the inner and outer wheel-edges is reduced, so that the farther out the wheel stands the better, or the less bad, the drive becomes.

But here is 11 inches of slip to every disk turn, sure, and slip of surfaces in good strong frictional engagement, too, or they could not drive the car, and they do drive the car, strongly.

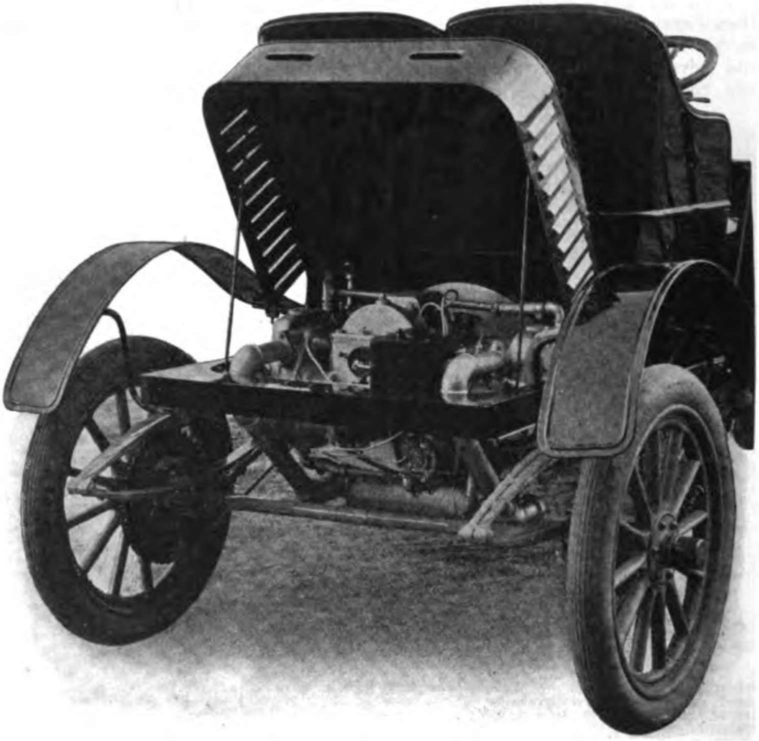
With the inside wheel edge at the disk center, the ratio of velocity variation is infinite, no matter what the wheel face is. With 1¾ ins. wheel face, and the inner edge of the wheel 10 ins. from the disk center, the disk would move about 63 inches past the inner disk-edge and about 74 inches past the outer disk-edge, making the slip per disk turn, about 11 inches; whether either edge of the disk or the middle of the disk does the driving, the 11 inches slip must be constant, but the slip ratio at 10 inches radius is not very great.

No one can tell just where the drive is from the disk to the wheel, and there must be a lot of friction which wastes power, same as there is with the best forms of hardened steel gear teeth. There is a great lot of wasteful friction in the paper and aluminum "Lambert" disk-drive, as shown by the regular and constant diameter reduction of the wheel by wear, which calls for a new paper wheel occasionally, but the wheels do not cost much, the part of them that wears out, and the replacement is easy.

Practically, then, the question is not one of waste by friction, but of how much this waste reduces the speed of the car, increases the driver's labor, and adds to the up-keep charges per mile of car travel.

The practical answer, as given by the "Lambert" car performance on the road, is that the friction-disk drive does not reduce the car speed at all, that it is by far the easiest on the driver of any ever fitted to a car, and that the up-keep charges are so small as to demand no consideration whatever.

This seems mechanically impossible, but on the road it was all true, vastly to the astonishment of the writer, who thought he knew, but did not know.



Lambert 1906 Model A, rear of car, engine cover raised, showing complete motor accessibility.

Here is what a "Lambert" car did, Dec. 8, 1905, with Mr. S. W. Lambert driving and the writer as passenger. The car was a 2200 lb. "Lambert" Model 7, with a capetop, driven by four 4½x5 in. vertical, 4-cycle, water-cooled cylinders. The day was fine. The roads were almost level, very good surface, loamy clay, where dry, but very slippery where wet, as they were for perhaps 25 per cent. of the total distance covered, and the road was also very crooked, and there was a good deal of town travel in the route, at slow rate, and there were many full stops because of frightened horses, and delays because horse drivers would not let the car pass. The car started at 9.10 A. M., ran from Anderson to Noblesville, from Noblesville to Pendleton and from Pendleton back to the Lambert shops in Anderson in 85 minutes. Distance covered, 48½ miles; high speed, as shown by recorder on the car, about 38 miles.

The morning was warm and beautiful, and the bare, frozen road-surface was thawing rapidly, and the 5-passenger car was light behind with only two passengers up, and Mr. S. W. Lambert, who is an extremely good and careful driver, was very reluctant in the matter of fast running, was constantly urged to pace by the writer, and drove the skidding car faster than he thought safe, and was glad to come to the journey's end.

The average speed was much better than 2 minutes to the mile, and twice the engine was stopped because of horses, and had be started again, and for miles together rear end of the car seemed to be on par skates, and once went much too far into ditch on the driver's side.

All this does not show much power loss friction driving. Mr. Lambert handled speed change often in silence and at pleasu and very sharply at times, and the behav of the car was perfect in every particul nothing could have been better.

Before making this run the writer passenger in another "Lambert" car in a sl speed very steep hill-climb, in which the formance was faultless, the friction d working more smoothly than any tooth gear-driven car the writer has ever ridden on low gear.

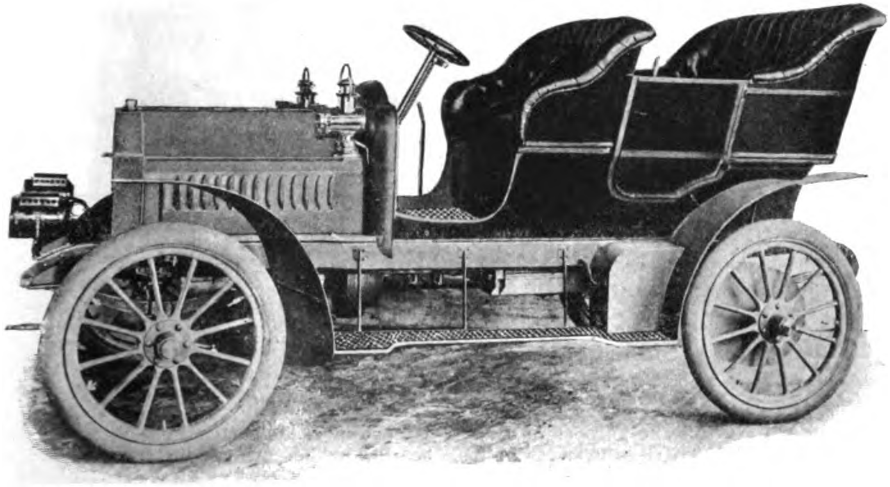
Looking back, it does not seem to writer that this 48½ mile drive could ha been made at better than 30 miles per ho but the timing was by both driver and senger, and the mileage was by record and the distance has since been otherw verified.

The start was at 9.10 A. M. and the wri walked into the Lambert shops at 10.35 M., making the total elapsed time 85 m utes for 48½ miles run.

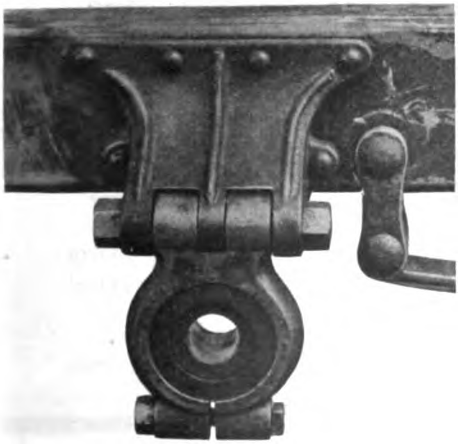
This is a road record to be proud of, un the conditions, and makes it easy for writer to believe the assertion of Mr. S Lambert that he drove the same car, 4 p sengers up, 179 miles, Anderson, Indiana, Delaware, Ohio, in 6 hours of total elap time, on the 20th day of September, 1905.

Crawford 1906 Five-Passenger Touring Car

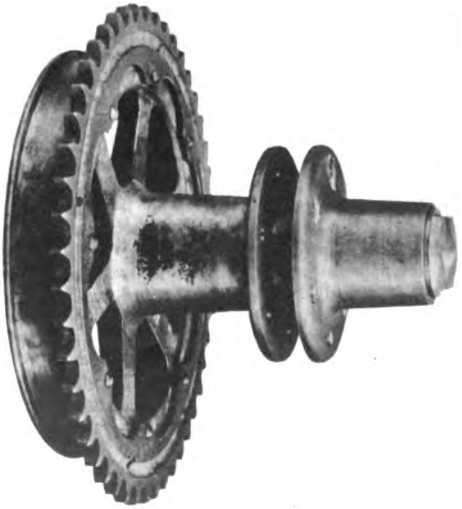
Crawford Automobile Company, Hagerstown, Md., have their 1906 car ready and will exhibit the same at the A. C. A. show in the 69th Regiment Armory. This car is driven by a 4-cylinder upright, water cooled 4½ by 4½ gasoline engine giving 24-28 H. P. and having cylinders cast individually. The four-throw crank shaft has bearing in five bronze bushings, giving a total bearing length of 14½ inches. The crank case covering can be removed without disturbing any adjustments. Lubrication of the engine is from a force feed lubricator. Jump spark ignition is employed, the four coils being located on the dash. The control is by throttle and spark.



Crawford 1906 five-passenger touring car. Four-cylinder upright 24-28 H. P. motor; sliding gear, three speeds and reverse transmission; double chain drive; jump spark ignition; wheel and pinion steering; wheel base 100 inches; standard tread; 34-in. artillery wheels; deep section pressed steel rim; angle iron sub-frame; weight 2100 lbs.; price $2,000.

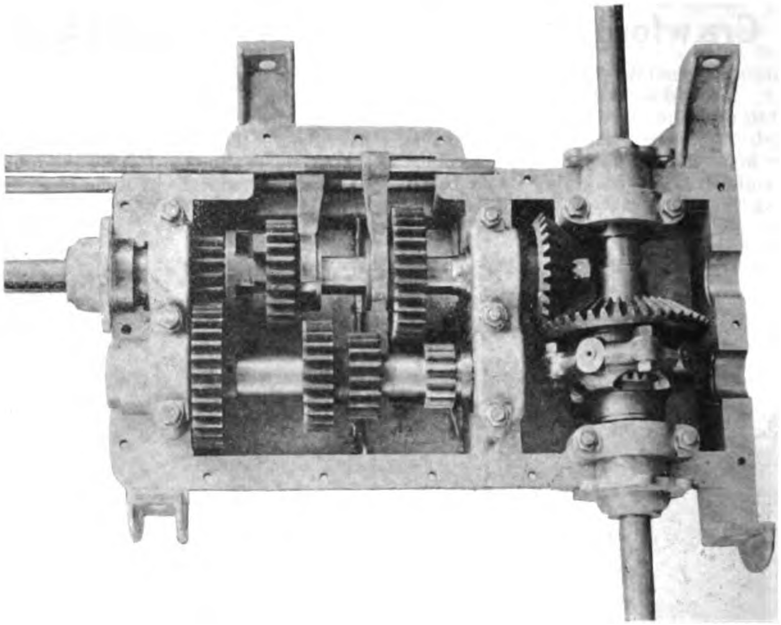


Cross Shaft Bracket Crawford Car.



Rear Hub of Crawford Car, etc.

A clutch of ample proportions is used and is of inverted type made dust proof by a leather diaphragm. It is operated by a foot lever and all forward clutch thrust is taken up by ball bearings. The sliding gear transmission gives three forward speeds and the reverse, all operated by one lever which has but one neutral point. From this neutral point any of the three speeds or the reverse may be chosen at will without passing through any other gear. Likewise while the car is operating on any of the gears, any of the others may be taken up by a single movement of the lever, without passing through an intermediate gear. A removable lever on the transmission case gives free ac-

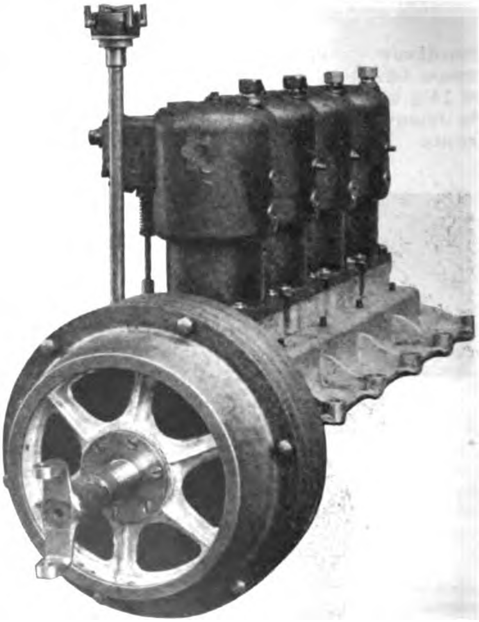


The Crawford Sliding Gear Transmission.

cess to interior parts for the purpose of making adjustments. The drive is by two chains on generous sized sprockets. Ball bearings are used throughout. Steering is through a wheel and pinion apparatus not susceptible to road obstructions. Large size tubular axles are used both front and rear. The maximum speed of the car is 36 miles per hour. The wheel base is 100 inches and the tread standard.

The 34-inch artillery wheels, all of which run on large ball bearings, are fitted with clincher or mechanically fastened tires, these types being optional with the purchaser. The frame is of deep section, sides being of pressed steel. An angle iron sub-frame is brazed up to carry motor and transmission, which are connected by double universal joint thoroughly dust-proof, the forward end having a long slip joint, hardened, making the clutch easily detachable for refacing. Springs are 38 in. in front and 40 in. in the rear, all four being semi-elliptics made of 1⅞ inch leaves. Two powerful brakes operate on the rear hubs, being put in play by a set lever. Two band brakes operated by foot act on the cross shaft. The differential is located in the gear box, and is protected from all strain. The dash is of the cabinet type with commutators and spark coils attached.

This car carries five passengers,—having a spacious rear seat which is 24 inches deep by 40 inches wide. Upholstery is in hand buffed leather over hair with springs in both cushions and back of rear seat. One of the special features of this car is the fact that all working parts are integral with the chassis and independent of the body which can be removed and car operated free of the same. Chains are covered by leather boots to keep them free of mud and dirt. The rear hub has a long sleeve that carries a sprocket and drum and is supported by a four inch rolle bearing which brings the chains in close t the frame entirely out of the way of the run ning board and step without any overhanging The strut rods are attached to separate bal bearings on the cross shaft and no movemen of the springs can cause the chain to eithe tighten or loosen.



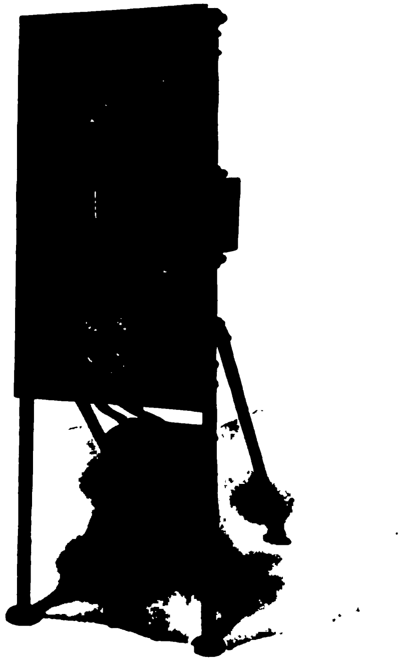
Crawford Engine, showing position of clutch and commutators. Ba
of motor will be changed from design shown.

A number of features have been incorporat ed in this car with the idea of adding to th comfort and convenience of the passengers

General Electric Company

To Charge Your Batteries

the best device is the General Electric Mercury Arc Rectifier, which changes the alternating current of the ordinary lighting circuit to direct current of proper voltage.



20 or 80 amp. outfit

Both the price and the cost of operation are low. It requires little floor space (only about 18 x 24 inches) and is the simplest charging outfit produced. It can be installed in your barn, and run by any employe of ordinary intelligence.

The rectifier will operate over a wide range of voltage and can be adapted to any commercial frequency. It is absolutely reliable in its operation.

A complete switchboard is supplied with every rectifier and the whole outfit has a very neat appearance.

There are also supplied special panels of extra capacity for garage charging, and special outfits for charging sparking batteries of gasolene machines.

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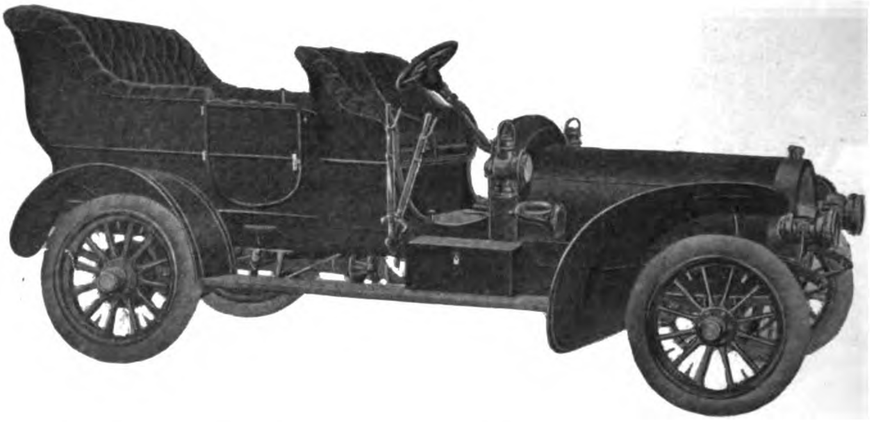
such as the pocket under the front seat which provides spaces for the largest size suit case without in any way hampering the passengers. A drawer also is provided under the rear floor which accommodates tire and tube in natural shape besides other articles which may be carried in the room within the circle of the tire. There is also a space under the rear seat for extra wraps, etc. Anoth drawer is formed by extending the toe ar heel board under the front seat to the botto of the frame, this drawer giving ample roo for pump, tools etc. A capacious portfolio leather is attached to the back of the fro seat. This car weighs 2100 pounds and lis at $2000.00.

The National 1906 Gasoline Cars

HUGH DOLNAR.

The National Motor Vehicle Company, Indianapolis, Indiana, U. S. A., offered one style of gasoline car only during the season of 1905, the most successful of its existence. this one 1905 National was a four-cylinder Touring Car, described in detail in January, 1905, and is substantially the same as the 1906 Model D, illustrated below. The National Company produced its first 4-cylinder car, Model B for the season of 1904.

From the first the National 4-cylinder cars were received with great favor, and were used with entire satisfaction by their purchasers. The National Cars have always been among the highest for American automobiles, and nothing has been spared to make them good in every detail as their designers and constructors could produce.



National Model E, 1906 6-cylinder touring car. Wheel base, 121 in.; gauge, 56½ in.; wheels, 34x4½ in.; motor, 6-cylinder, water-cooled, 4-cycle, 4½x5 in., compression, 85 lbs.; 60 B. H. P. at 1200 R. P. M.; side entrance tonneau body, built in seats for 5 passengers, and two folding seats in tonneau, closing against the front seat back and opening out to rear to seat two additional passengers facing front, seven passengers in all; weight, 2900 lbs.; price, $4000, including mats, horn, full tool equipment, 5 lamps and generator, all complete for extended touring.

The 1904 Model B motor had four cylinders 3¾x4 ins., nominal 20 H. P. The 1905 Model C had four cylinders 4¼x5 ins., nominal 30 H. P., and the 1906 Model D substantially the same as the 1905 Model C, is driven by four 4½x5 in. cylinders, showing the regular yearly increase of power which has marked the productions of all successful builders.

As the National Company was in 1904 among the leaders in American production of 4-cylinder driven cars, so now in 1906 it is again among the first to increase the number of the cylinders in its leading car, a new car, Model E, from four to six, the cylinders being the same for both 1906 models, 4½ x 5 ins.

Exactly the same chassis design, save number of cylinders appears in the tw National 1906 models, the dimension of Mod E being greater throughout than those Model D, but everything is of the same ge eral form in both cars.

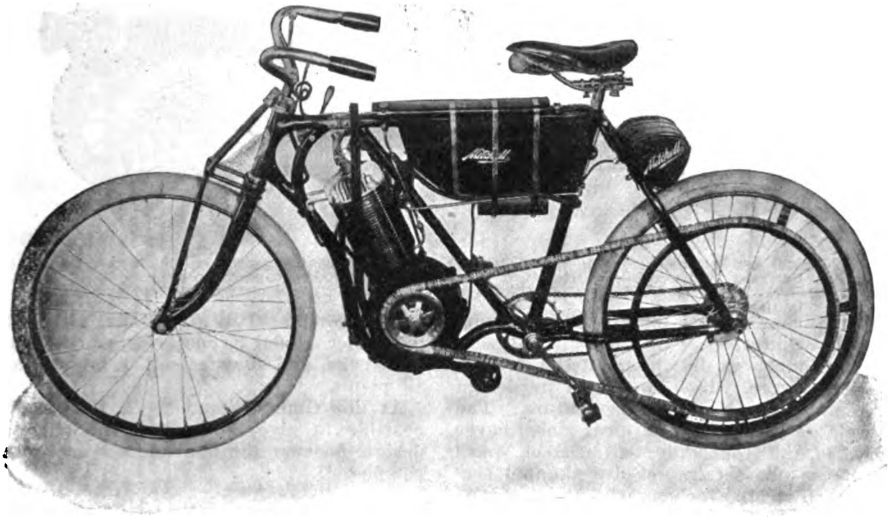
The intention of the National manageme has been from the first to produce the ver best car possible in points of ease of runnin durability and certainty of action without r gard to construction cost, fitted with bodi inferior to none in elegance of finish ar luxurious appointments.

Up to 1906 the National car bodies hav been of wood; the two models here show have cast aluminum bodies throughout, bot models same construction, wood being en ployed for the body sills only. These ne cast aluminum bodies are built up of fo principal aluminum castings only, exclusi of doors, and are of course vastly superi to any wooden or pressed sheet metal co struction.

The 1906 National models supass those previous years only because of the general a vance in motor car construction, but a undeniably in the front rank of self-driv vehicles.

All the National journals save those of t crank-shafts are on Hess-Bright and He Bright type ball bearings. The rear whe bearing balls, and in fact all the bearing ba throughout both models, except those carr

Mitchell



PRICE, $175.00

It is Economy to buy the best in motor cycles. Profit by the experience of those who have lost money in handling other makes, and push the sale of the **MITCHELL** exclusively. You will never regret it. The price at which it is sold enables you to make a good profit, and as the **MITCHELL** when once sold stays sold, you have none of the after annoyances which so often beset the dealer who has the misfortune to handle inferior makes.

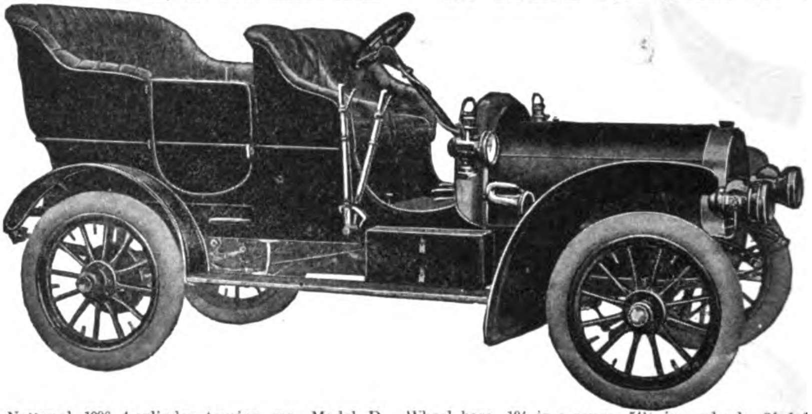
Do you want to sell a practical, reliable, safe and economical motor cycle? Then get the **MITCHELL.** Write at once for agency terms.

MITCHELL MOTOR CAR CO.

Racine, Wis.

Members American Motor Car Manufacturers Association.

ing the change gear side-shaft are of this same diameter, ¾ inches. The side-shafts are on ⅝ balls. These ball bearings in the wheels and throughout the National cars make them run with less friction than any car using other forms of bearings. The National cars carry no load on any revolving member. The rear wheels run on the extended rear axle sleeves, the rear axles themselves acting as drivers merely, and carrying no weight whatever.



National 1906 4-cylinder touring car, Model D. Wheel base, 104 in.; gauge, 54½ in.; wheels, 34x4 in.; motor, 4-cylinder, water-cooled, 4-cycle, 4½x5 in.; tonneau, detachable, to seat 5 passengers; 40 B. H. P. at 1200 R. P. M.; weight, 2550 lbs.; price, $3000, including same full equipment as Model E, ready for extended touring.

The National was first to adopt the circular form of radiator, which they hold by design patent and make a distinctive feature. The rear axle gear housing is a steel globe, cover screwed in, the front axle is all of steel, yokes applied, the chassis frames are channel section pressed steel, 5 inches and 4 inches greatest width. The springs are all half elliptic 40 inches front, 50 inches rear, Model and 40 inches front and 56 inches rear Model E.

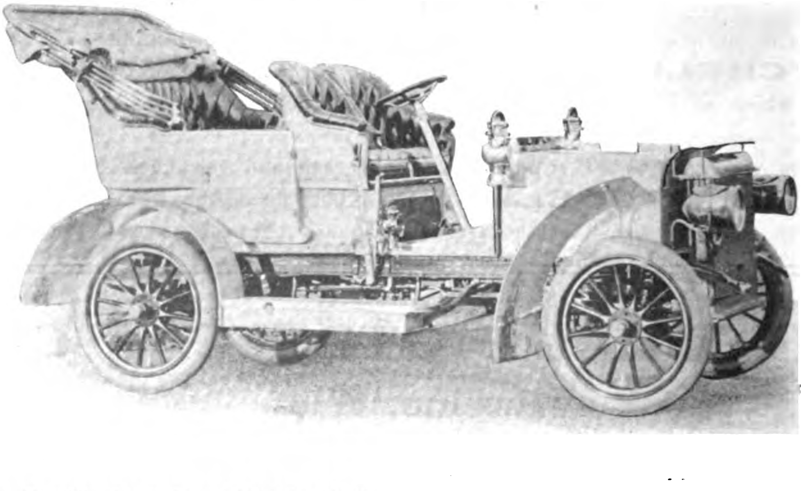
The extremely long wheel base, 121 inche of Model E, gives ample touneau room for th folding seats, so that 7 passengers, all faci front, can be commodiously carried.

The National 1906 models are not y wholly completed in all details, although t 6-cylinder Model E has been on the road f six weeks, and shown itself to be excellent all points.

At this time, December 12, 1905, it is i possible to give more than the outlines design, because the final models are not ful completed.

Lane 1906 Steam Car.

The 1906 Lane car, made by Lane Motor Vehicle Co., of Poughkeepsie, N. Y., is a flexible, powerful, simply constructed car of handsome appearance, showing no radical changes from previous years' designs, this car being the result of seven years' experien in steam car building and containing no u tried features. It is furnished with K. of aluminum body at $2250, or without tonne at $2100. It is also furnished with an exte



The 1906 "Lane" Steam Car; price $2250; pressed steel frame; wheel base 97 in.; tread 56 in.; wheels 32 in.; tires 4 in.; compound, 15 H. P., 3¼ and 5¼x3½ engine; splash lubrication; tubular burner; 20-inch burner; water tank capacity 20 gallons; fuel tank 17 gallons; automatic; water level; automatic air pressure; independent auxiliary steam, air and water pumps and tank filler; combustion products and warm air from condenser carried down under the car.

The Auto Supply Co.
INC.
1662 BROADWAY, N.Y.

Our Annual Greeting

We do not look upon the automobile business as a gold-brick game or "get-rich-quick" scheme.

We feel confident that the automobile has come to stay, and that a great future awaits the industry.

We started early, and have steadily grown with the business.

Our efforts to please our patrons regardless of dollars and cents have been fully rewarded by thousands of well satisfied customers and friends, whose good-will we value as our greatest asset.

We are determined more than ever to merit their confidence, and take this opportunity to extend many thanks for past favors.

Everything for the owner, chauffeur and auto

We are often surpassed in price, but never in quality, assortment and promptness.

Our stock consists of the most complete line of up-to-date **SUPPLIES, AUTO APPAREL** and everything useful in the line of **TOOLS.**

Our **SIXTH ANNUAL CATALOGUE** is in the hands of the printers, and we shall be pleased to place your name on our mailing list.

Our exhibit at the Auto Show, Madison Square Garden, is Space No. 126.

WE ARE THE ORIGINAL AUTO SUPPLY COMPANY

Beware of the so-called supply houses who have adopted names similar to ours in order to create confusion. Evidently the fakirs can't swindle their victims unless they trade on some one else's well established name and reputation.

We maintain no branch houses. Our only place of business is

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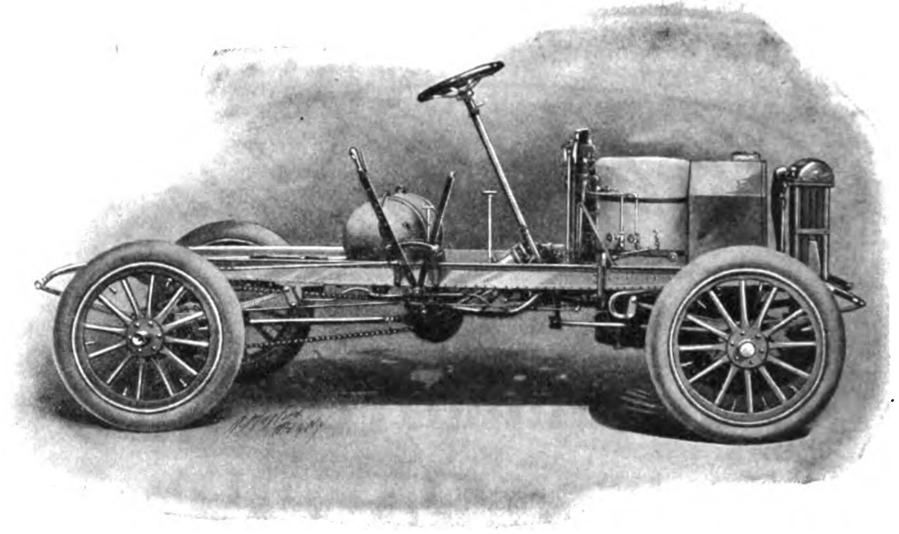
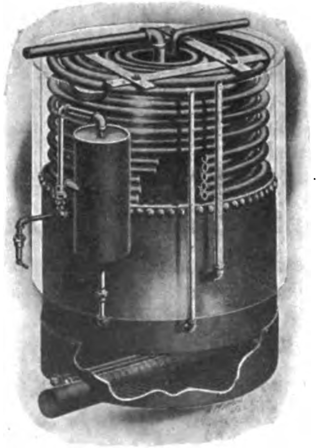


Chassis of Lane 1906 car, side view.

sion top and front storm curtain for $2400.

Probably the most strikingly new feature of the 1906 Lane Steamer is the adoption of roller bearings in the engine in place of plain bearings used heretofore. The Lane company are opposed to the use of ball bearings in a steam engine of this size, and have heretofore clung to the use of plain bearings, but they believe that the use of roller bearings is an improvement.



Lane Boiler.

The Lane Boiler, shown herewith, resembles the flash type and furnishes superheated steam uniformly under all changes of load. Only water cooled surfaces are exposed to the flame, and it will therefore not burn out. The feed water enters at the top of the flash coil, and is first heated by the spent gases whic have lost enough of their heat to be useles against the hotter parts of the boiler below The water then passes through each succeeding coil below, coming into contact with hotte surfaces as it progresses and issuing fro the bottom coil into the centrifugal separato as steam and water. From the top of th separator on the side of the boiler the stea passes to the upper part of the shell boile located beneath the coil, the water passin by gravity to the lower part. Steam i drawn from the head of the shell boiler. Th large and closely set steel fire tubes in th shell permit the flame to burn freely insid of them. The surplus heat that passe through them is partly absorbed by the coil above, and the products of combustion pas off at a much lower temperature than th steam that issues from the boiler. A condenser is fitted which returns practically al water under normal conditions.

The burner is made entirely of tubing. Th tube ends are free, and no part can b strained by expansion and contraction. Th mixing tube exceeds in length the diamete of the burner, insuring a uniform mixture o air and vapor. The flames are in straight rows, with an air space between each tw rows.

The engine is a cross compound with cylinders 3¼ and 5¼ ins. in diameter, respectively, by 3½ ins. piston stroke. The steam chests are adjacent to each other between the cylinders, and both have slide valves. The engine frame is of steel rods, suitably braced. The crank shaft is of one piece construction, the whole piece hardened and bearings ground. The main shaft and wrist pins are roller bearing and the eccentrics ball bearings.

To more properly take care of the varied interests controlled by them, the Decauville Automobile Co., 56th street and Broadway, New York, has recently incorporated subsidiary companies, which are the Gaulois Tire Co., Dac Automobile Supply House, The Franklin Agency Co., and the Birdsall Mfg. Co.

Three Jackson 1906 Cars.

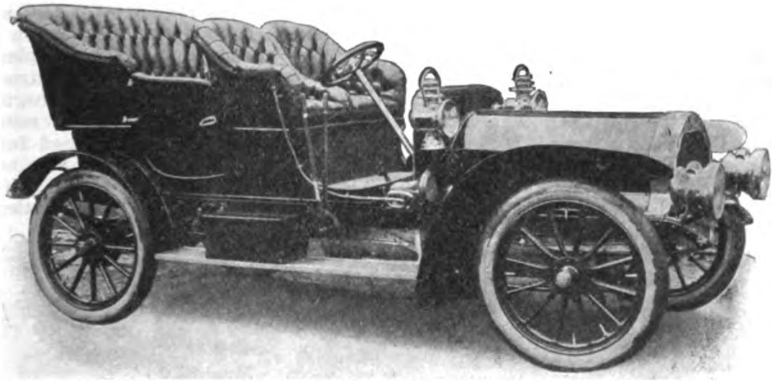
HUGH DOLNAR.

The Jackson Automobile Company, Jack- n, Mich., U. S. A., having done a very ccessful business in 1905 with a single odel of motor car, has extended its line of roduction, and will offer two additional odels for 1906, a new Model "G" 4-cylinder, ertical motor, cylinders 5x5, three speeds rward and a reverse sliding gear, with bevel ear to the rear axles, listed at $2500.00, id a new Model "D," a lighter car, planetary vo speeds and reverse change gear and evel gear to rear axles, driven by a pair of 4x5 horizontal opposed cylinders set cross- ise in front, listed at $1500.00, and will ntinue the very satisfactory 1905 Model ," driven by a pair of horizontal opposed linders set lengthwise of the car, planetary ange gear and chain drive to the rear axles. he 1905 5x5 cylinders for this last car have en enlarged to 5¼x5 for 1906, and have en greatly improved by placing the cam- aft on top of the crank-box, and carrying e outer end of the cam-shaft in a large- nge sleeve-bearing, so that by taking out e flange screws the cam shaft and cams n be taken out. The push-rods are in direct ie with the valve-lever ends, and the cam- ver and top crank-box member can be suc- ssively removed, so as to wholly disassem- e the motors without disturbing the cylin- rs.

In Model "D," 2-cylinder bevel gear, the vo speeds forward and a reverse planetary ange gear has been greatly improved, as fully shown in the sectional illustration, so at the planet pinions are stationary in re- ect to the casing when on the high gear, as ual, and also so that no sudden stress is rown on the change gearing in changing om low to high gear. Planetary change ear failure is not unknown, and the break- ge of the driving pinion, which is the com- on form of failure, is caused by the sudden cceleration in changing from low to high ear, which makes a virtual blow on the iving pinion tooth engaged, and this causes the breakage. In the improved Jackson 1906 planetary gear construction, friction disks are applied at each end of a planetary gear member, seven disks in all, making a very soft and gradual engagement, no matter how rapidly it is applied, and also vastly reducing the lever impulse required to effect the engagement.

The planetary brake-bands will be of bronze, fitted metal to metal in Model "D," while remaining fibre-lined, as in 1905, in the Jackson Model "C." This car proved so wholly satisfactory in 1905 that the only changes thought advisable for 1906 are the increase of the cylinder bore from 5 to 5¼ ins. and the placing of the cam-shaft on top of the crank-box, with the specified construction detail changes, for more ready assembling and disassembling.

The increase in cylinder bore gives the 1906 Jackson Model "C" at least 20 per cent. more power than it had in 1905, although the car was then very strongly driven, and the change in motor construction gives several highly desirable advantages. No addition has, however, been made to the selling price of the Jackson Model "C," which will remain at $1250.00.

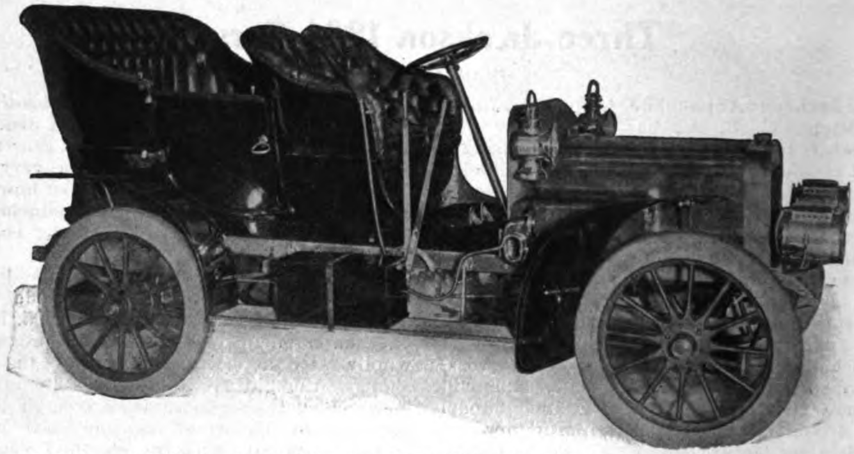


Jackson Model "G," 1906, 7-passenger touring car. Wheel base 108 in., gauge 56 in., wheels 34x4 in., chassis frame pressed steel, all channel section; motor four cylinders, vertical, water-cooled, four-cycle, 5x5; sliding gear, three speeds forward and a reverse, bevel gear to rear axles. Side entrance tonneau body, built-in seats for five passengers and folding seats for two in rear of driver's seat; weight 2500 lbs.; price $2500, including mats, horn, tools and five lamps, ready for extended touring.

Models "C" and "D" will be fitted with detachable tonneau side-entrance bodies, both for five passengers. The 4-cylinder 1906 new Model "G" will have a built-in side-entrance tonneau body, with stationary seats for five passengers, and, in addition, two folding seats are hinged at the back of the front seat, to give seven passengers room when desired.

The Jackson factory capacity has been and is being greatly increased, so that it is expectd to build at least three times as many cars in 1906 as were turned out in 1905, with much less contracting outside, the Jackson plant now being equal to the construction of all the 1906 motors and planetary change gears on its own premises.

All the Jackson cars are well upholstered with the best materials, the workmanship of



Jackson two-cylinder bevel gear drive, new Model "D," 1906; wheel base 100 in., gauge 56 in., wheels 32x3½ in.; pressed steel chassis frame; motor, a pair of horizontal opposed, four-cycle, water-cooled cylinders, 5¼x5, set cross in front, improved planetary two-speed and reverse change gear and bevel gears to rear axles; detachable tonneau body to seat five passengers; weight about 1950 lbs.; price $1500, including mats, horn, tools and five lamps, ready for extended touring. This is an entirely new design, with several new features of motor construction, abundant power and only moderate weight, with ample room for five passengers. This car is of fine appearance and is capable of high speed with full load. It is only 100 in. wheel base and has a detachable tonneau, so that it can well be used as two-seated car, a large runabout, in crowded streets.

the machinery is good and the finish is excellent, giving the cars a fine appearance, and the three Jackson models here described give a sufficient variety to meet the requirements of agents desirous of handling the product of one manufactory only.

THE WHEELS.

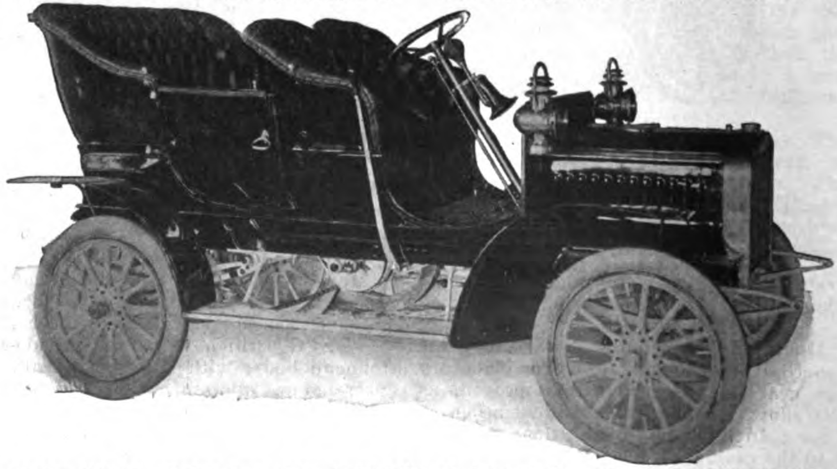
The three wheel diameters used are 34, 32 and 30 ins., with 4-in. and 3½-in. tires. All front wheels are on ball bearings. All rear axles are on Hyatt roller bearings, with adjustable ball bearing thrusts. The balance gears are all Brown-Lipe, spur. Models "D" and "G" have the driving wheels fixed to the tapered axle ends with keys and nuts. In Model "C," the axle ends are squared, and the square-eyed hubs are pin retained.

Struts are used in Model "C," chain-drive, only. Models "D" and "G," bevel gear driven, do not use struts in any form, but depend on the springs for pushing the car.

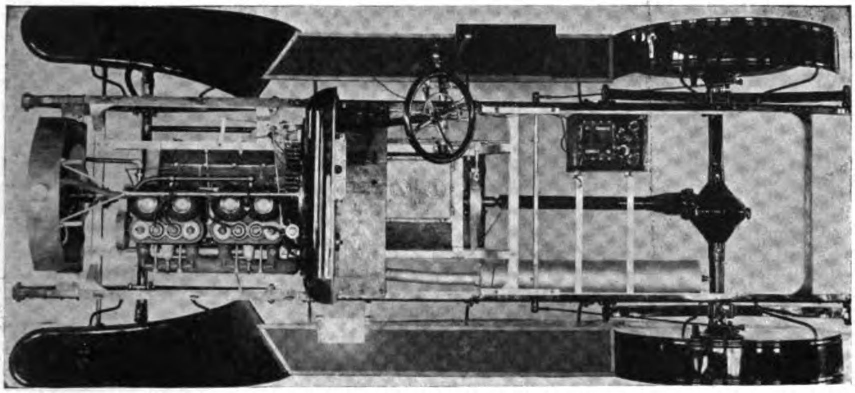
TORSION RESISTANCE.

Torsion of the rear axles is also resisted by the springs. The strut and torsion arm were given all manner of shapes and placings, and could never be made right by anyone, simply because, as is now generally recognized, they were worse than needless, as, except in case of the chain-drive, the supposed functions of the strut and torsion-arm are better performed by the rear half-elliptic springs alone.

The springs are all half elliptics. Model



Jackson 1906 two-cylinder, chain drive Model "C"; wheel base 90 in., gauge 56 in., wheels 30x3½ in. Channel steel chassis frame; motor, a pair of horizontal opposed cylinders, four cycle, water-cooled, 5¼x5 in. set lengthwise of car, planetary speed change, two forward speeds and reverse, chain to rear axles, detachable tonneau body, side entrance, seats for five passengers; weight 1800 lbs; price $1250, including mats, horn, tools and three oil lamps. This car is improved for 1906 by added piston area, giving about 20 per cent. more power than its highly satisfactory 1905 prototype. The value of ample piston area has not been hitherto fully appreciated by automobile constructors, who were satisfied with good hill climbing power and high speed on the level. The 1905 Jackson Model "C" was powerfully driven, was a good hill climber and a very speedy car on country roads. The 1906 increase of piston area not only gives more power on hill-climbing and more heavy-road speed on the level, but makes the motor more economical in fuel consumption on level good roads, where the charge is closely throttled on the high gear and the compression is consequently low. It is expected this 1906 Jackson Model "C" will prove even more attractive to purchasers than the 1905 car, for which orders exceeding the factory capacity were written.



Jackson Model G, 1906, chassis plan. The chassis frame is 152 in. eye to eye in length and is 38½ in. wide, parallel. The support and placing of the sub-frame is shown in this and the detail views of this new Jackson car. This illustration shows the symmetrical oil lead placing and accessibility of wiring.

"G" has front springs, 44x2 ins., seven leaves, perched 2 ins. forward of centre, rear springs 46x2 ins., seven leaves, perched in the middle.

Pressed steel frames, channel section in all members, cold riveted, are used in Models "D" and "G."

Model "C" has a channel steel chassis frame, mitered corners, with heavy angle-steel corner reinforcing, hot-riveted.

MOTOR PLACING.

In Model "G" the 4-cylinder motor and sliding gear speed change are carried on a depressed channel-steel sub-frame, with one Spicer universal joint to the propeller shaft.

In Model "D" the crosswise two-cylinder motor has the cylinder heads each fixed at one point to the lower channel section side-frame member, and the transmission casing, bolted to the crank box of the motor, is supported on a chassis frame depressed cross member, making a three-point motor assemblage fixing to the chassis frame, also with one Spicer globe joint to the propeller shaft.

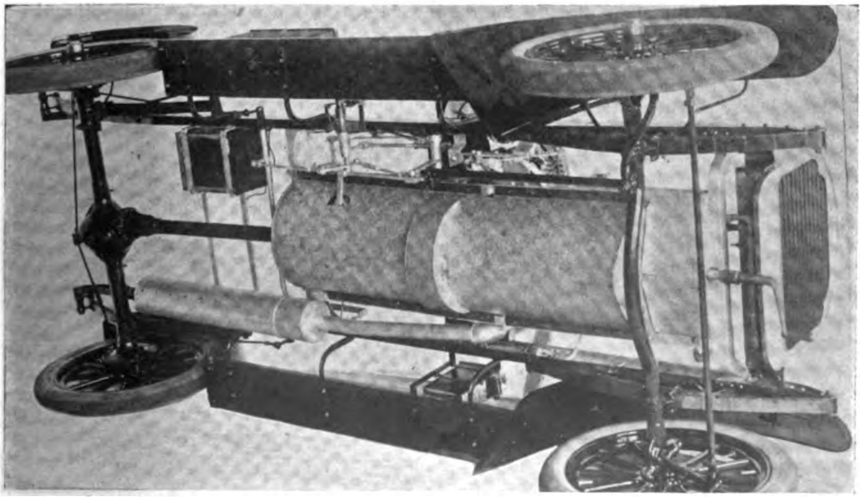
In "Model C" the cylinders are placed lengthwise and fixed under two angle steel cross girts. The Model "C" struts have flat joints to the axle sleeve, and are screw adjusted with globe joints on the chassis frame.

THE MODEL "G" FOUR-CYLINDER MOTOR.

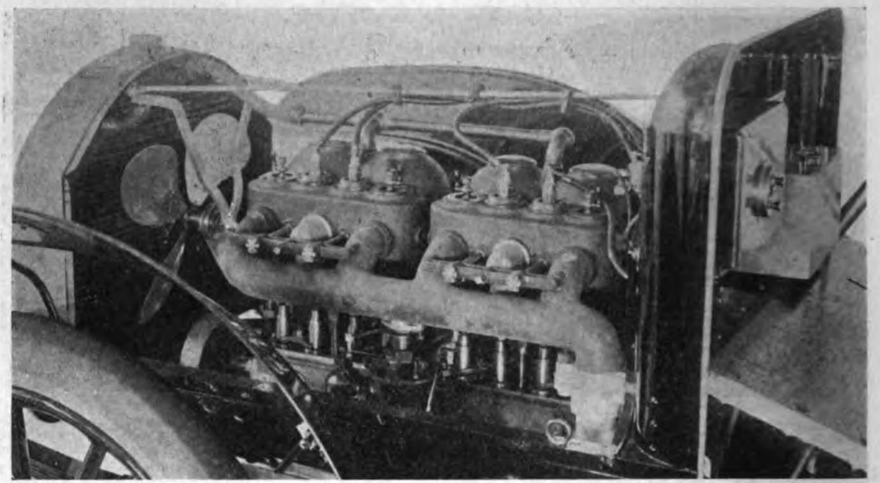
This is a very powerful engine, with four cylinders, 5¼x5 in., 65 lbs. compression, giving ample power for the high gear drive when closely throttled. The carburetor is a standard float feed, not described in detail. The arrangement of the intake and exhaust piping is clearly shown in the illustration, and permits ready placing and displacing.

CLUTCH.

This is a five disk multiple, two bronze disks between three grey iron surfaces. The



Jackson Model "G," 1906, chassis underside, showing Jackson pressed metal motor and transmission shield. The shield form is clearly shown in this illustration; this first shield had just been placed when this picture was taken, and the drain cock, in the bottom of the fly wheel pit, had not been placed, and does not show here. The shield is formed up by hand, over a gray-iron forming block, and is composed of two pieces, the larger one under the motor and change gear box and the smaller one in front under the starting crank. The material is 20 gauge sheet steel. Together these two shield pieces, retained with strap iron, light bars and screws at the edges, wholly protect the moving parts from road drift.

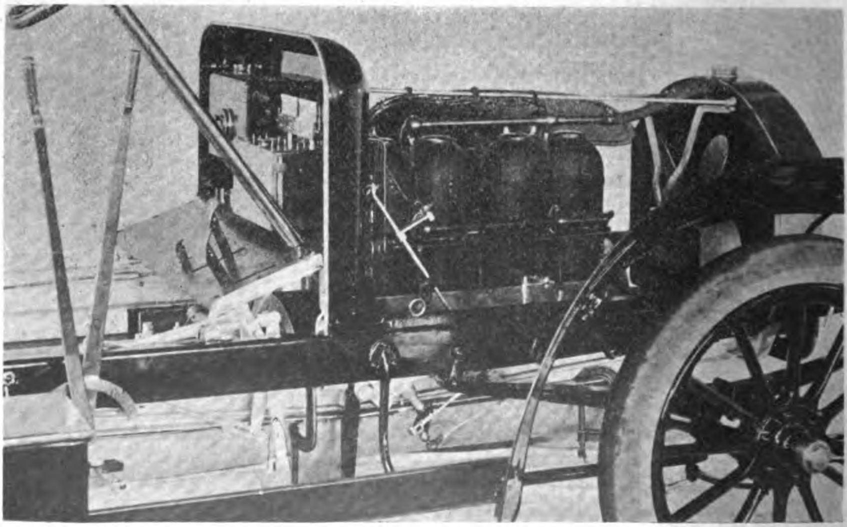


Jackson Model "G," 1906, left side of motor, showing the intake and exhaust piping and fan, which is belt driven, and is on ball bearings. The pistons are plain, slightly tapered, smallest at top, free in the cylinders when cold, have three rings above the pin, 45 degree lap, pinned to piston. The pins are hollow, steel, hardened and ground 1⅛ in. diameter, fixed in pistons. The rods are H-section Manganese bronze, top ends split and fitted with two pinching screws to take split white bronze bushes on the piston pins. The wrist ends of the rods have hinged caps, adjustment is made by studs, nuts, check nuts and split pins, and are babbitted with white bronze on the wrists, same lining used for crank shaft boxes.

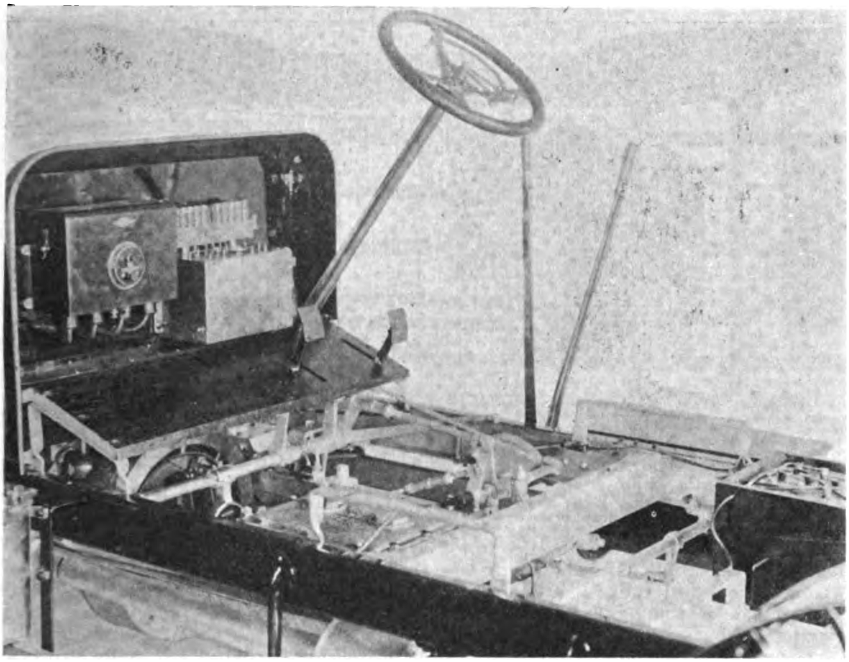
engagement is effected by four toggle-actuated bell cranks, having temper screws in their effective ends. This clutch is well protected on its open side, though not wholly dust proof, and the motor and clutch are fully protected by the pressed metal dust shield under the entire propulsion system. This shield is an absolute necessity and has been approximated in various forms of blankets and tarpaulins, all unsightly and frail, and only partially effective. This pressed steel Jackson shield is a neat, substantial and thoroughly effective arrangement, very durable, not at all in the way, and fully protecting everything from dust, gravel and road drift, which are
so destructive to working machinery, and a
catching all oil and other drippings from
motor and machinery throughout.

The sliding gear is three speeds forw
and reverse, selective type, side shaft runn
with line shaft, all in plain bronze bearin
all gears steel and case hardened, and r
ning in an oil pool in the lower member
the aluminum gear casing.

The propeller shaft is cased in a steel t
up to the telescoping front squared end, wh
telescopes in the rear Spicer universal jo
member. The regular ordinary brake dr
8 in. diameter by 2 in. face, fibre lined bra
band, is fixed on the front member of



Jackson 1906 Model "G," right side of motor and control. This illustration shows the fan, cylinders and front board, with the levers and pedals.



Jackson Model "G" footboard, front board rear and control. The outside lever stands idle to front and is pulled to rear to first disengage the clutch and there apply the emergency rear hub internal brake shoes, expanding grey iron, and fitted metal to metal. The right hand pedal does nothing except to apply the fibre faced external brake band to the ordinary brake drum on the line shaft in rear of the change gear casing. The inside pedal is pushed forward to first disengage the clutch and then release the latch which locks the inside vertical lever, so that speed changes can be made by the lever handling. The change gear lever is neutral when vertical, is on high gear at forward extreme, first station to rear is intermediate gear, second is low gear and extreme rear position gives the reverse. The spark and throttle are controlled by small levers, notched segment retained on top of the hand wheel. The small plunger pedal is for the muffler cut out. The twenty-gallon fuel tank is carried under the driver's seat on the two brackets seen, one on each side, supported on the rear transmission cross girt, which is heavy and substantial. The Kingston muffler is fitted and is a perfect silencer on the car, with so little back pressure that the exhaust can hardly be heard where the cut-out is opened.

Spicer universal joint on the line shaft.

CONTROL.

This is most simple, Model "G" having two ertical hand levers, two vertical pedals and wo small hand levers, notched segment reained on top of the hand wheel, for spark nd throttle regulation, all as shown in the ontrol illustration.

Model "D," two cylinder bevel gear, has ne outside hand lever, two vertical pedals nd two hand levers for spark, and spark and hrottle control under the hand wheel.

RADIATION.

The water circulation is thermal, purely. In 905 the Jackson cars were fitted with a large apacity, three-pinion water-force pump, which circulated the water more rapidly than he radiator would cool it and so supplied the water jackets with high temperature cooling water, under certain conditions, low speed of ar with high motor speed, which reduced the adiator efficiency while giving the greater olume of heat to be dissipated. This largeapacity water pump circulation made the radator boil. By cutting out the pump it was ound that the thermal circulation only, by imply slowing the passage of the water hrough the radiator made the radiator much nore efficient, so that under no combination of effects could the radiator be made to boil he water, and the increased heat of the water when the motor was pushed increased the rapidity of water circulation, all exactly as seemed desirable. Extended testing without the water pump gave continued favorable results, and for 1906 the Jackson company are fitting no water-circulating pumps whatever.

IGNITION.

Jump spark plugs are used with storage batteries on Models "D" and "G," and dry cells on Model "C." The wiring is carefully supported and is accessible.

Hill's Precision Oilers are fitted to all three of the 1906 Jackson cars, and particular attention has been given to placing the oil leads, which are symmetrical in appearance, and well carried.

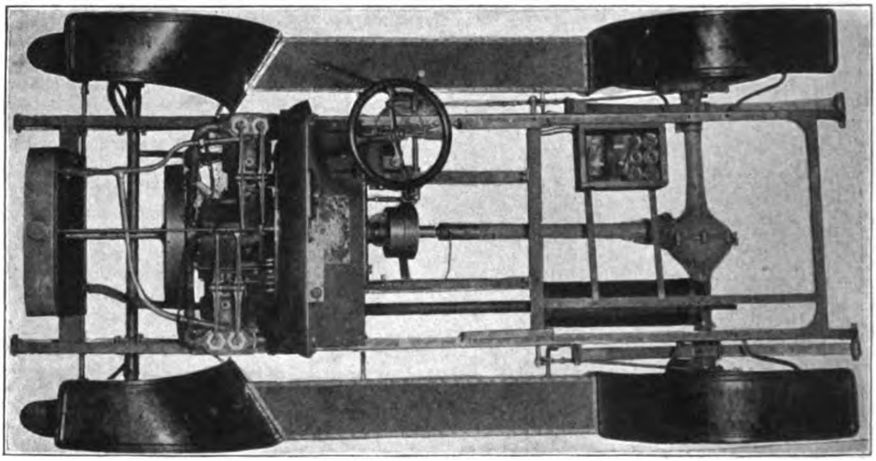
Pressed steel front boards are fitted to Models "D" and "G" and are made to house the oiler and coil box. Model "C" has a flat front board, which carries the coil box, the oiler being placed on top of the crank box. All front boards are fixed to the chassis frames, so as to permit driving without the body being on the car.

STEERING ACTION.

This is the same for Models "G" and "D," a multiple thread hard steel worm engaging a bronze worm gear sector.

In Model "C" the Brown-Lipe internal worm surrounding the worm gear sector is used.

Model "C" takes one full turn of the steer-

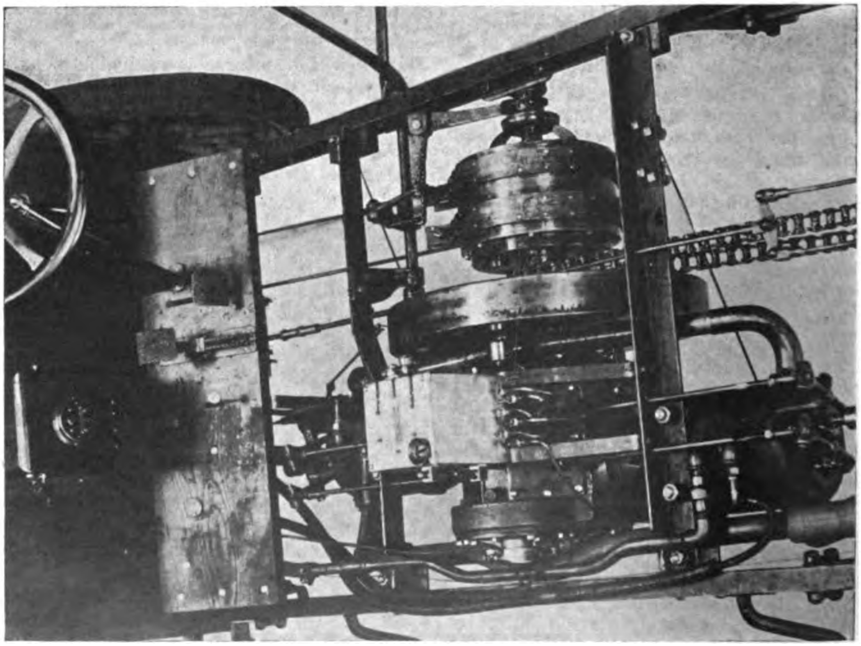


Model D Jackson, chassis plan; 2-cylinder opposed engine, 5¼x5, placed forward under hood, drive by shaft through two-speed forward reverse planetary change gear.

ing wheel for the full sweep of the front wheels. Models "D" and "G" take 2¼ turns for the front wheel full range. This is the largest movement of the hand yet recorded by the writer. These cars steer easily and well in every particular, and the large steering wheel movement is said by the Jackson testers to be perfectly satisfactory. The movement of the hand wheel should, for all kinetic and machine considerations be made as great as possible without inconvenience to the driver.

MODEL "D" ENGINE.

This two-cylinder opposed type engine, with 5¼ in. bore and 5 in. stroke, is placed crosswise under the hood and drives through a shaft. The crank shaft is drop forged from special high carbon steel, made exceptionally large and strong and carefully ground true to size. The pistons, cylinders and crank case are made from special semi-steel castings, giving the maximum strength for weight of material. Pistons and cylinders are carefully ground and lapped to fit; all



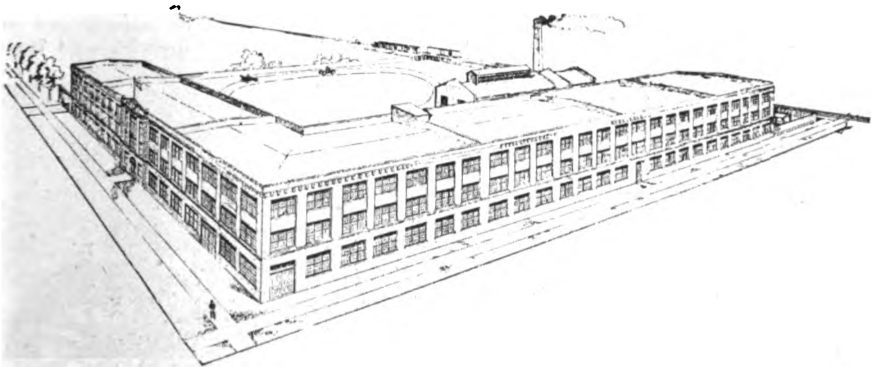
Jackson 1906 Model "C," plan of motor and control. The planetary gearing stayed together very well in 1905, but for 1906 the addition to piston area was met by increasing the face of all gears. The crank box pressure oiler used in 1905, while perfect in action if clean, had very small power, only the gravity of an inch or two of head to make it deliver oil, and has been replaced by the Hill Precision arrangement, placed on top, which has a good strong oil pressure to displace oil lead obstructions, and has no valves whatever, and hence requires no valve adjustment.

arts are interchangeable. Crank pin ends ave babbitted bearings, which can be renoved or replaced at any time in a few minites without disturbing any of the other arts. The piston pin ends are bushed with hosphor bronze and are adjustable for wear; ll adjustments made through large hand oles in the case, which can be readily renoved without any interference from other arts. Pistons have three eccentric packngs, rings cut diagonally and pinned to preent turning. Intake valves are mechanicaly operated. All valves are placed vertically n top of cylinder. Exhaust and intake alves are identical and interchangeable. 'alves and seats can be taken out by the emoval of one nut, and extra valves and eats can be carried and replacement made n the road. Cam rolls and valve adjustng mechanism can be removed without disurbing other parts. Cam shaft, cams and earing can be removed by simply taking off he small cover at side of case. All parts, ncluding crank shaft and fly wheel, pistons nd connecting rods, cam shaft, cams and iming gears, rolls and roll carriers, valve ods and valves, can be taken out readily vithout removing the motor or disturbing the onnections. The water jackets are amply arge, entirely surrounding the valves. Cirulation is by thermo-syphon system, doing way altogether with circulating pump.

MODEL "D" TRANSMISSION.

The change gear of the Model D is of the internal gear planetary type, two speeds and reverse. High speed clutch is the multiple disk type, entirely independent of the gearing. All pinions are steel bronze bushed. Entire transmission is enclosed in oil-tight case, and all adjustments are made from outside of case. All gearing, brake bands and high speed clutch run in oil fed from splash from the engine case. All gears except internal are made from steel carefully cut.

A feature of this transmission is that none of the gears or parts run faster than the motor. This insures a gear which is very smooth and efficient in action, practically noiseless in operation, reducing wear to a minimum, delivering maximum amount of power to the drive wheels. There is no strain on the gearing, when driving at full speed ahead, the clutch carrying the full load and not dividing it between clutch and gearing, as is the case with the usual planetary transmission. The driving gear is a large internal one made from semi-steel, giving more than twice the strength of any of the so-called all spur gear types. Brake bands are made from best phosphor bronze, carefully machined to fit, insuring a very smooth yet positive action, making it possible to manipulate the car without shock, yet giving ample power under all conditions. The top half of transmission case can be taken off and entire transmission removed without disturbing any of the adjustments or controlling mechanism.



New Plant of the Wayne Automobile Co., now n course of erection at Piquette avenue and Brush street, Detroit, Mich. The main building, three stories high, will be 400 feet on Brush street and 300 feet on Piquette avenue. The testing building will be back of the main building, 36x100, and the boiler and engine room, 30x45, with a covered loading platform, 150x16. There will be a private running track, inclosed, to test the machines on the grounds. All he buildings will be mill construction and will be provided with the sprinkler system. The builders are nder contract to have part of the main building and testing building and the boiler and engine house nished by January 15, 1906. The remainder will be completed in the spring.

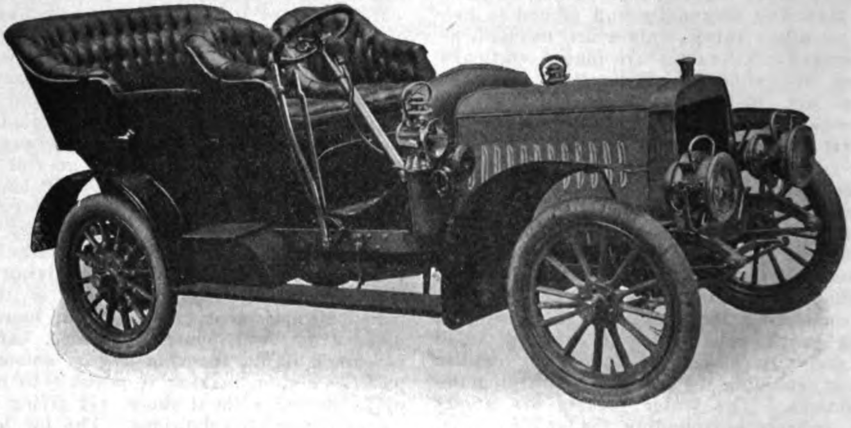
It is no credit to any man to say that he is too busy to read his trade papers, but, on the contary, it is a reflection on his business sagacity, and when he has properly systematized his affairs he will realize that it is important to set apart a time for such reading as it is to do the many other things that enter into the routine of his business If the time cannot be spared during the day, the evening hours may be profitably devoted to it with the added advantage of fewer interruptions.—Trade Press List.

In addition to their 16 H. P. $1200 touring car the Columbia Electric Co., 23 East Ohio street, Indianapolis, Ind., are marketing a 12-14 H. P. centre chain driven runabout, with or without tonneau. The two cylinder, double opposed engine is located under the body and will drive the car at speeds of 3-35 miles per hour. The wheel base is 80 in. and tread 56 in. It has a divided front seat, detachable torpedo deck, is equipped with 28x3 in. tires, horn, rear light, two side lamps and sells for $800.

1906 Berkshire Cars.

E. S. FOLJAMBE, B. S.

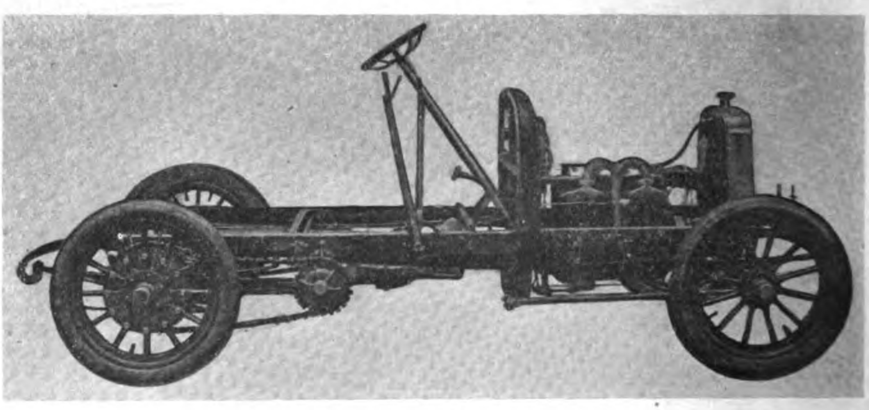
The Berkshire Automobile Co., of Pittsfield, Mass., offers for 1906 a choice of three models which are strictly American in design and suited to the conditions among which they are built, the Berkshire Hills of Western Massachusetts. These cars differ principally with respect to their wheels, wheel base and power, the horse power in each case being that developed at the rear wheels and not at the engine.



Berkshire Model A.

The specifications of the three models are as follows:

Model A—A 4-cylinder engine, 4⅛x4½ in., rated 20 horse power, jump spark, Berkshire sliding shaft transmission, three speeds and reverse, side chain drive, wheel base 98 ins., tread 56 ins., wheels 30x3½ ins., side entrance tonneau, 4 passengers, will carry five, weight 1800 lbs.



1906 Berkshire Car. Side view of chassis.

Model B—Four-cylinder engine, 4¾x5½ ins., rated 30 horse power, wheel base 115 ins., tread 56 ins., wheels 34x4 ins., weight 2450 lbs., otherwise same as Model A.

Model C—Six-cylinder engine, 4¾x5½ ins., rated 50 horse power, wheel base 122 ins., tread 56 ins., wheels 34x5 ins., engine base of manganese bronze instead of alumin five passengers, weight 3200 lbs., otherw same as the other models.

The detailed description which follows Model A, with the exceptions noted, cover all three models.

BODY.

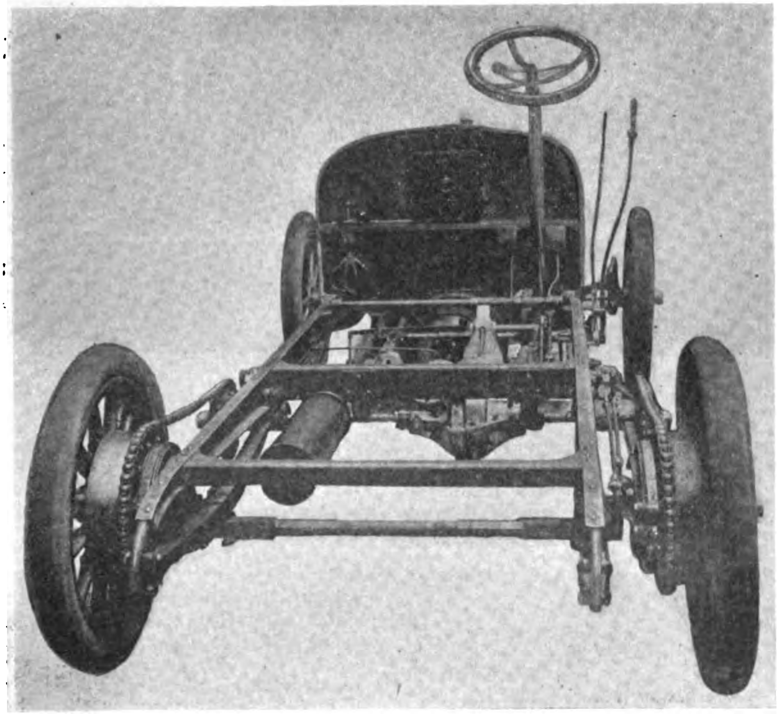
The body is entirely of laminated w suitably reinforced and highly finished. tonneau is large and the seats very comf able. The upholstering is exceptionally d and luxurious. Doors are hinged on front so that they will swing shut instead opening from the car's motion. The l are graceful. The front seats are divic The floor boards slope up sharply at front, giving good support to the feet. der the rear seats, with a lock door, is a la carrying space. The gasoline tank is ur the rear of the car, and force feed is ployed. The dash is curved cast aluminur

TESTING.

The 4-cylinder 4⅛x4¼ in. motor is con vatively rated at 20 horse power at the r wheels. Each car is thoroughly tested in following manner: In a pit in the floor placed a 40-kilowatt generator coupled to a shaft carrying at each end a pulley. The car s placed and locked so that the rear wheels rest on the pulleys. The engine is then run and the power delivered at the wheels determined by the volt and ammeter readings. The result is placed on a tag attached to the car, which is now ready for a test over the Berkshire Hills in the vicinity. If up to the standard in these tests the car is completed and body put on.

MOTOR.

The motor is 4¼ in. bore by 4½ in. stroke. The cylinders are cast separately with water jackets and heads integral. The valve chambers are located on opposite sides. The cylinders are finished to an exact size and true surface by grinding. They are square at the base and held to the crank case by studs and lock nuts. The crank case is an aluminum casting of rectangular section, and fitted on the right side with two brass breathing pipes, which are held by cap screws. The case is divided horizontally into two sections. The upper section carries the main bearings and extends outward, forming webbed arms, which support it on the frame. The bottom section may be lowered by removing the lock nuts and taking out the square headed bolts, leaving the shaft and main bearings in position. The pistons are of gray cast iron, those on the small car carrying three rings above the wrist pin and on the larger cars, four above and one below. Just above the lowest ring a wide oil groove is cut around the piston. The pistons are a straight taper from top to bottom of five 1000th of an inch. The rings are eccentric step jointed and pinned. They are finished on a special machine by grinding all over. Another special machine has been devised by means of which the piston and its rings are made to reciprocate in the cylinder, while at the same time the cylinder, which is bolted to a kind of horizontal table, is made to rotate. Special abrasive powder and oil are used in this operation, with the result that the piston rings are smooth, well fitted and tight.

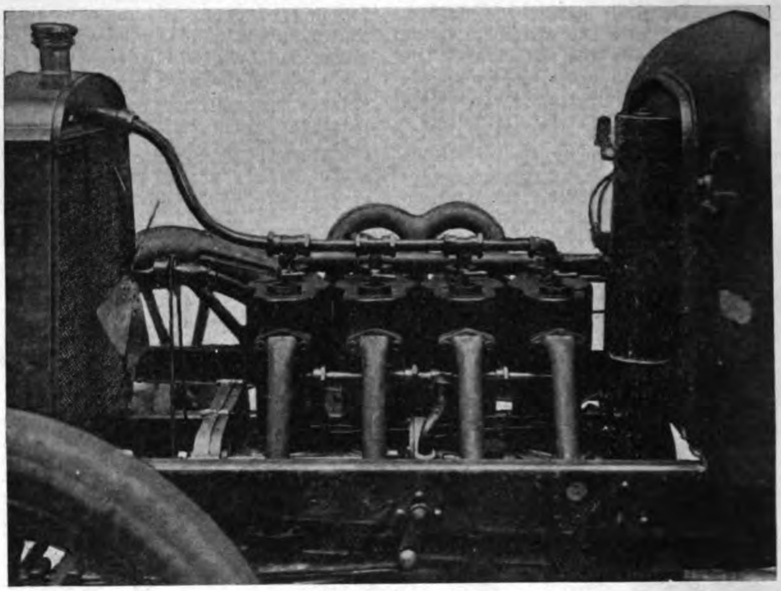


1906 Berkshire car. Rear view of the chassis, showing the frame construction, rear axle brakes, location of muffler, sector pedals, auxiliary hand oil pump on the dash and the coil.

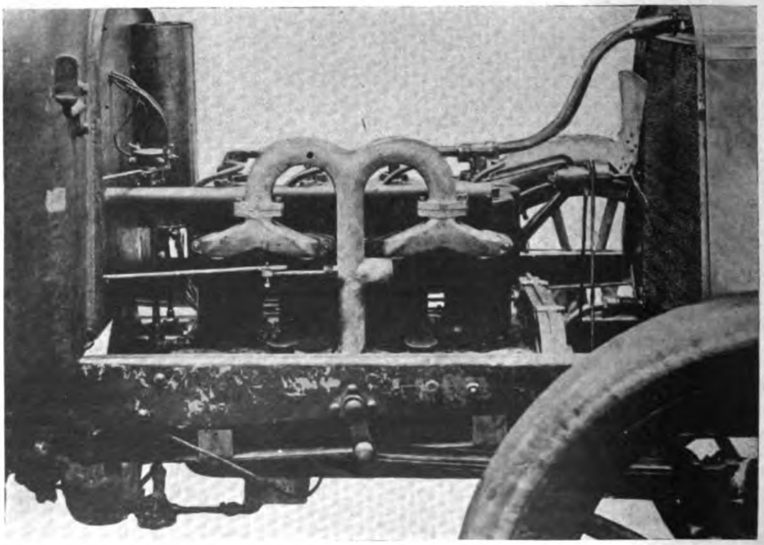
The wrist pins are hollow steel, 1⅛ in. diameter on the small car, and 1¼ in. on the larger models, case or pack hardened and ground. The pin is retained by set screws through the piston bosses. Wires are put through holes in the inner ends of these set screws and then bent, which makes a perfect lock, and one which can be easily removed.

The connecting rods are of I-section manganese bronze, which shows by test from 75,000 to 80,000 lbs. per square inch tensile strength. The connecting rod cap is held by studs which are screwed into the rod and pinned, double locks nuts and cotter pins being used. No shims are inserted.

The main shaft, 1½ in. diameter, is made of nickel steel hand forged from one piece, with a flange, for bolting on the flywheel, integral with it. The two end pistons and the two middle pistons move together. The shaft is supported in five combination babbitt and bronze bearings, the end ones being each four inches long. The shell of these bearings is bronze, with a wearing surface of babbitt anchored to it by grooves and holes. The crank pins are 1½ in. diameter, same as the shaft. The valves made of nickel steel with heads and stems integral, are all mechanically operated and interchangeable. They are placed on opposite sides of the engine, and may be removed through the top by unscrewing a brass plug piece with a notched periphery. These are made tight by having copper asbestos gaskets under them. The spark plugs are screwed into the top of the covers over the inlet valves. Over each exhaust valve is screwed a compression r lief cock, with its upper end forming a cu for priming or cleaning. The usual co springs are used to close the valves. Th spring is held by resting on a washer, whic in its turn rests upon a pin which is he from slipping out by fitting into a recess i the bottom of the washer. The push ro are case hardened steel running in bron guides. No rollers are used at the low ends, but the rod is formed into a horizont circular disc. This end is hardened and rid on the cam. The bronze guides are held



Left side of 1906 Berkshire engine, showing exhaust pipes, water pump in the middle, inlet water pipes and outlet water pipes to the radiator, the fan, the neat gear case over the 2 to 1 gears, the compression relief and priming cocks on top of the cylinders and the large oil tank on the front of the dash.

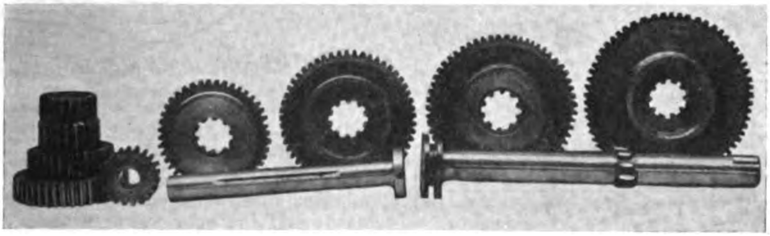


Right side view of 1906 Berkshire engine, showing the arrangement of the inlet pipes, throttle valve in the pipe, location of the timer close in front of the dash with short wires. At the bottom of the cut can be seen the gear pump for the oil circulation.

e case by cap screws.

The two cam shafts are each supported in ur bronze bushings. The cams are sepa- te, are made of steel and hardened. They e fastened in position after adjusting by o taper pins rivetted over. The two to one ars are enclosed by a neat aluminum case. o governor is used. A cast iron flywheel ins. diameter is held by five bolts to the nge on the crank shaft.

A 1906 Holley carburetor with an auto- atic auxiliary air inlet is used. The throt- valve placed in the inlet pipe between the rburetor and engine can be seen in right de view of engine. The inlet pipe from the rburetor is cast aluminum of the Y variety, e branches of which are fastened to the linder by cap screws. The exhaust pipes oper are cast in one piece. From each cyl- der a pipe runs straight down and joins to the one-piece casting, the branches of hich curve in a graceful sweep into one rge pipe, which gives a space of large vol- ne into which the engine exhausts. These haust pipes are held at each cylinder by o cap screws. Special gaskets are used.



1906 Berkshire sliding shaft transmission, showing the individual members. The long shaft with the ring of teeth upon it is the sliding member. The gears at the left are keyed to the other shaft, while the gears shown standing are loose on the sliding shaft, but may be locked to it by the ring of teeth meshing with the internal gear of any one. The gears are always in mesh.

COOLING.

The engine is water cooled. A Briscoe ellular combined tank and radiator is used. n aluminum cased bronze centrifugal pump n the left side of the engine, gear driven rom the exhaust cam shaft, draws water rom the bottom of the radiator and forces it hrough copper pipes into each cylinder jacket ust below the exhaust chambers. The water eaves the cylinders at the head and is con- ucted through a brass pipe fitted to each ylinder, to the top of the radiator. Convec- ion currents throughout the radiator are naintained by a four-bladed ball bearing luminum fan mounted on a bronze bracket. The fan is driven by the usual circular sec- ion leather belt from a pulley on the end of he engine shaft.

ENGINE OILING.

The gravity feed system through a hollow rank shaft is used in preference to the plash. A three-quart copper tank is located n the front of the dash near the engine and nder the hood in order to keep the oil fluid t all seasons of the year. From this the oil lows by gravity feeds to the main bearings nd through oil holes drilled through the shaft. Centrifugal force throws it outward hrough holes in the crank webs to the crank pins. The surplus or overflow from these bearings makes an oil mist in the crank case which is sufficient for oiling the cam shafts and pistons. Oil thrown into the sides of the case runs down and strains into a receiver at the lowest point. From this a small bronze gear pump, driven by a vertical shaft rotated by bevel gears on the rear end of the inlet cam shaft, draws the oil to force it up into the tank again. This system evidently gives very little trouble, as those who have used it say that they have to give it practically no attention.

IGNITION.

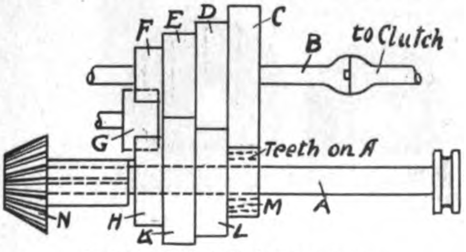
All models are supplied with jump spark ignition by storage battery, which is located in a box on the running board. Auxiliary dry batteries are carried in a special space arranged across the car under the dash. The four vibrating coils are located on the dash, and a French roller contact aluminum covered timer of the latest design is conveniently placed on the end of a vertical shaft driven by encased bevel gears from the rear end of the inlet cam shaft. The timer or commutator is close to the front of the dasn, making the wiring short. A two-throw switch is accessibly located on the coil box.

CLUTCH.

The clutch is an aluminum leather covered one of the self-contained variety, which gives no end thrust when engaged. It engages a steel cone-shaped ring bolted to the rear of the flywheel. It is 11½ ins. diameter, and has a liberal width of face of 2¾ ins. The clutch is moved by a forked arm or yoke. The ends of the yoke arms carry small trunions, each fitted with a kind of shoe, which slides in a circular groove in a ring rotating with the shaft. This is shown in the accompanying drawing.

TRANSMISSION.

The transmission is distinctly a new type, resembling both the individual clutch system and the sliding gear. It might be called a sliding shaft transmission. With reference to the accompanying sktch, it will be seen that there are two shafts, A and B. Shaft B is in line with the engine shaft and connected to the clutch shaft by an Oldham flexible coupling, while shaft A, which is on one side and free to slide longitudinally, carries the driving bevel pinion N and its sleeve. On the shaft B and rigidly keyed to it are the gears C, D, E and F, which are always in mesh with M, L, K and H, respectvely, on the shaft A, but not fast to it. The inside of gears H, K, L and M are notched so as to closely resemble internal gears. Shaft A is made to slide lengthwise by a yoke and collar operated by the speed lever. This shaft is provided with a ring of teeth beveled at the edges and resembling a sliding gear. Therefore by sliding shaft A its ring of teeth may be made to lock any one of the gears H, K, L and M to it. Gear C drives M, which, if locked to shaft A, gives the high speed. This is, of course, not a direct drive. Gear L locked and driven by D is the second speed, while by locking K to the shaft and driving by gear E gives the first speed. The reverse is obtained by locking H when the driven is through F, the idler G on the stud shaft and gear H. The hardened steel gear N made integral with its sleeve is splined on to the shaft A. Its outside is ground to form a long bearing. All gears are made of nickel crome steel, and the bearings are of bronze babbitted. The members of this transmission are shown unassembled in the accompanying cut. A small notched sector is arranged at the forward end of shaft A, into which a pin fits when the teeth on A are properly in mesh. The clutch will not go in unless this pin is in its slot. At the factory in testing out this transmission the interlocking safety device was removed and the car run at a speed as high as 25 miles, and then the reverse was thrown in to see what would break first, with the result that after several trials they succeeded in damaging the differential, but the transmission stood up. This is rather harsh treatment, but such is often necessary if one wishes to test the strength of a new device. This transmission was designed by the superintendent and mechanical engineer of the company, Mr. G. P. Hollister.



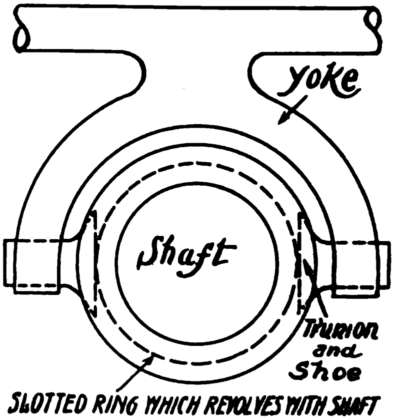
Berkshire Sliding Shaft Transmission.

The same case carries at the rear end the bevel gear differential and the jack shaft running in long bronze bearings. The drive is then by side chains to the rear wheel. The new Diamond chain, 1¼ in. pitch is used.

The front and rear axles are both solid, of square section, and without a weld. On the 50 H. P. they are drop forgings of I-section.

STEERING GEAR.

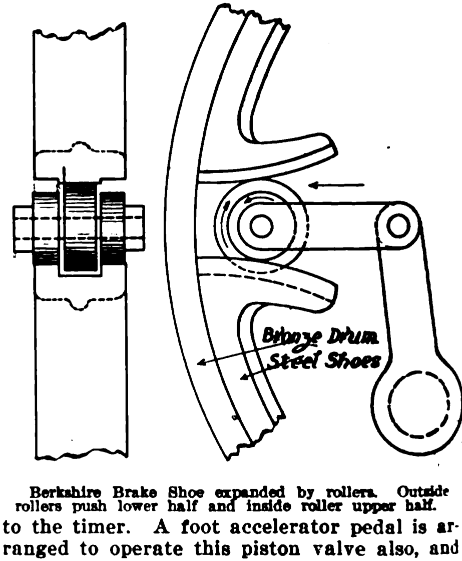
The steering post is hollow and contains the throttle and spark controlling rods. The wheel is made of one piece of wood and the spokes of brass. The steering gear consists of a worm and segment. An eccentric bushing is used, which throws the segment further into the worm and gives a slight adjustment in case of wear. The worm is hardened, while the segment, in order to be the more readily replaced, is left soft. The usual ball sockets and spring pressed blocks with locked adjustments are used on the drag link to the steering knuckles, which are of the well-known Lemoine type. The cross link is placed in front of the axle. All these rods or links are made of Shelby steel tubing, the ends are fastened in by pinning and brazing. A groove is also cut in the inside of the tube and filled with spelter so that after heating the brazing forms a ring, which is claimed materially helps in securing the parts.



Berkshire Clutch Shifting Yoke.

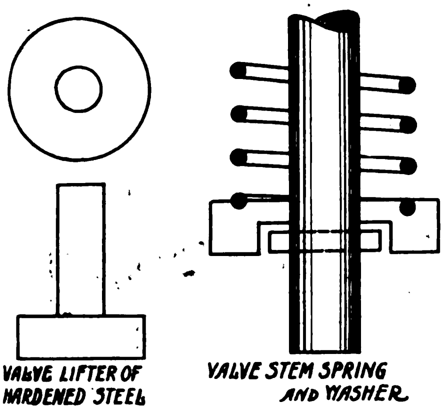
CONTROL AND BRAKES.

As usual the spark and throttle levers are mounted on a stationary notched retaining segment above the steering wheel. The controlling rod passes down through the hollow post to connect with suitable linkage to the balanced piston valve in the intake pipe and to the timer. A foot accelerator pedal is arranged to operate this piston valve also, and when released the valve comes back to whatever setting the throttle lever on the wheel indicates. The pedal on the extreme left



Berkshire Brake Shoe expanded by rollers. Outside rollers push lower half and inside roller upper half.

operates the clutch alone. Two sets of brakes are supplied, both acting on drums on the rear wheels. The foot pedal on the extreme right controls the contracting band brake of about 11 ins. diameter. The band has a renewable face of specially prepared canvass about the same thickness as the ordinary fibre or leather facings. By test the Berkshire Company have demonstrated its extremely good wearing qualities. This foot brake, although single acting, is very smooth and powerful.



Berkshire Valve Lifter and Valve Stem Spring and Washer.

There are two side levers; one operates the shifting of the shaft in the transmission and gives the speeds, the other works on the notched quadrant and controls the emergency brake also on the rear wheel. This brake also throws out the clutch. It is of the expanding band type. The shoes are of cast steel, hinged or pivoted at one side and pressed outward at the other side, by the expanding action of three hardened steel rolls, as shown in the accompanying sketch. It will be noticed that the outside rolls press downward on the lower shoe and revolve in the opposite direction from the larger centre roll, which pushes upward on the other shoe. A very slight pressure is all that is required to make this brake do its duty on the steepest hills. The brake pull rods are all made of steel tubing, very light and tough. The sprocket wheels are bolted to the drum casting. Radius rods extend from a pivot joint on the rear axle to the front end of the rear springs, and are fastened with a ball and socket joint to the spring support, which is riveted to the frame. This radius rod is also a hollow steel tube, and is adjustable in length. It takes all the driving strains, such as the pull of the chain, off of the springs.

FRAME.

The frames of all models are of pressed steel 3-16 in. thick, narrowed at the front to give more room for cramping the wheels. The sub-frame is also of pressed steel, channel section. Heavy gusset plates, hot riveted, are used at the corners, which makes a very stiff frame.

The springs are both semi-elliptic and placed under the frame and on top of the axles. The front are 34 in. long and the rear 44 in. in the 20 H. P. model.

The Berkshire cars are strictly American and are being worked out on their own lines in many important details. Their successful progress has been carefully watched, as it is from such concerns that we must look for new features suited to American roads and conditions.

The New Cars of The Hewitt Motor Co.

The Hewitt Motor Co., of 6-8-10 East 31st. Street, New York are making rapid progress toward the completion of their new cars, and will have several new models ready for inspection in a very short time, and expect to be prepared to take orders for prompt delivery by the first of the new year.

These new cars comprise a 10 H. P. runabout, weighing 1200 lbs., and with a speed capacity up to 34 miles per hour, a Landaulet, seating five persons and employing the same motor as the runabout, but with the speed limited to 18 miles per hour, and weighing complete 1900 lbs., being designed particularly for city and suburban use; a delivery wagon employing the same chassis as the landaulet, and being particularly suitable for town and city delivery service with a load carrying capacity of 2000 lbs.

Also a very carefully designed four cylinder 25 H. P. touring car having a speed capacity up to 40 miles per hour, and lastly a heavy 25 horse power truck with a carrying capacity of some three tons and a speed limit of 12 miles per hour.

Each of the various cars of the Hewitt Motor Co., present a large number of novel features which will undoubtedly attract much attention both from users and designers, many parts of the new cars presenting entirely original features which have been worked out by the designers, Messrs. Hewitt and Snyder, entirely without regard to the well known and extensively copied lines so much in evidence in many new productions.

It is the intention of the company to exhibit their full line of cars at the forth-coming show, by which time they expect to be in position to bid actively for business.

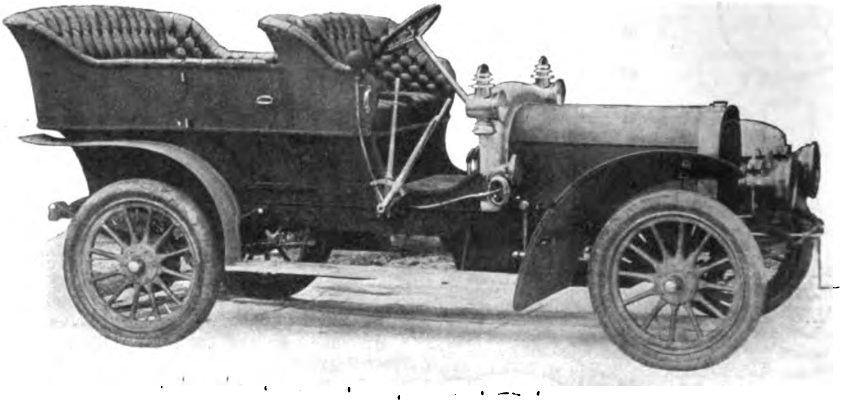
Full and complete descriptions of these various cars will appear in later issues of the "Cycle & Automobile Trade Journal," the illustrations and full data not being available for this number.

Percy F. Megargle, of trans-continental fame, and David F. Fasset, an expert mechanic from the Reo factory, have started to cross the sandy wastes of California, Arizona and New Mexico in a 16 H. P. Reo car.

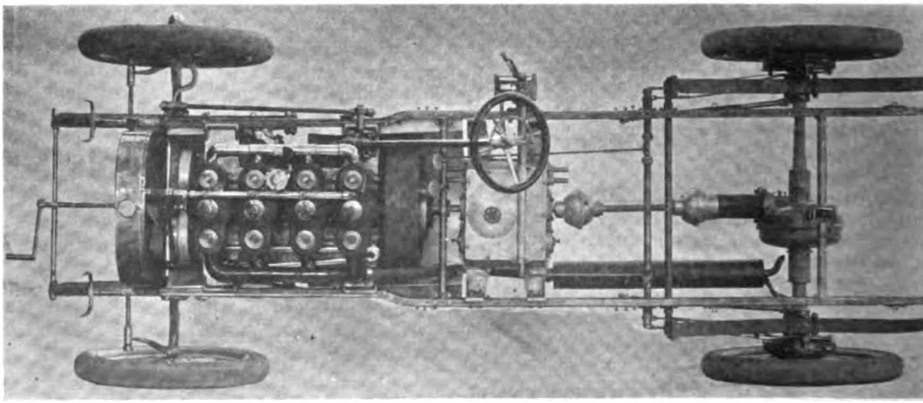
This issue is sold for 50c. a copy. The next issue will be a triple show number, which is worth almost as much. The March number of the CYCLE & AUTOMOBILE TRADE JOURNAL will be a complete vehicle number, in which an illustration and description of every car on the American market will be printed, arranged compactly for comparison and reference. There are many other special numbers throughout the year, in addition to the large amount of matter contained in our regular numbers. You will do well to subscribe immediately. Subscription price is $1.00 per year. Blank will be found on page 444.

Haynes 4-Cylinder 50 H. P. Car for 1906—Model R.

The new Haynes cars offered for 1906 by the Haynes Automobile Company of Kokomo, Ind., are a 50 H. P. 4 cylinder vehicle known as Model R, and a runabout, Model O, which has the same chassis. Haynes 1906 car body design is the creation of a Paris body maker, and the first cars turned out, which were toured about the country on a 5000-mile demonstration trip, were frequently taken for French productions. The materials used and design of the Haynes cars are the result of the Haynes Company's twelve years' successful experience in motor car building. Most of the materials, alloys and tempers in the vital parts are peculiar to Haynes cars, many of them being made in their own shops, foundry and furnace. In such portions of the car where stock materials are suitable, such as upholstery, etc., the best grade of materials obtainable are used. Seat and cushion stuffing is of pure curled gray hair and hand buffed leather is used. The bodies receive 18 coats of lead, paint and varnish.



Haynes Model R, 50 H. P., 4-Cylinder Car.



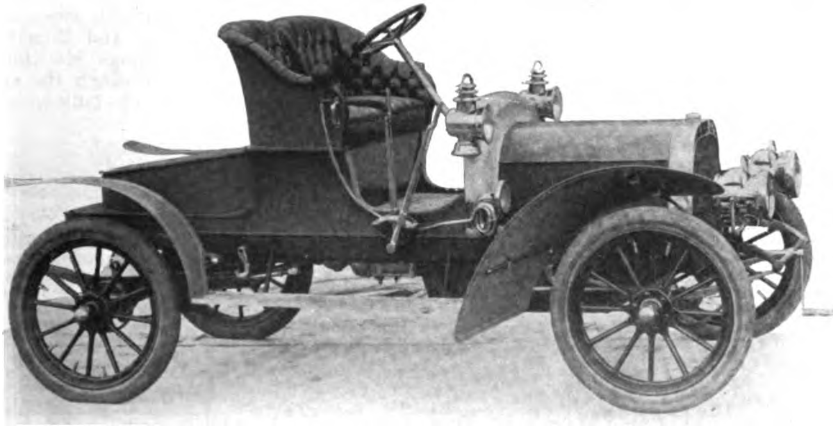
Haynes Model R Chassis.

The success of the Haynes cars has been, in quite a large measure, due to their adopting various valuable suggestions made by users. As these suggestions are based the knowledge gained by practical road perience and intimate acquaintance with ditions met in daily road service, the Ha Company has shown good judgment in b guided by these suggestions and in inco rating improvements along the lines gested in its cars.

The Model R engine has four vertical inders cast separately, each 5½x6 ins. I velops 50 H. P. The cylinder metal is a cial compound which takes a polish like holding compression perfectly. The jackets are cast integral and provide an usually large water space entirely surro ing the valves. Inlet and exhaust valves on opposite sides and are turned from nickel steel alloy drop forgings. The mediate reducing gear is fibre lined to sil gear noise. Reducing gears, cams and shafts are completely housed and oiled splash from the engine base. The engin hung directly to the steel frame by arms integral on the upper half of the crank no sub-frame being used. This construc permits the removal of lower half of case, giving ready access to all internal parts of engine, i.e., crank shaft, connecting rods, pistons and bearings. The cam shaft housings are external. Thus access may be had to any part of the engine for repairs, adjustments or inspection without disturbing any other part.

The piston ring construction is peculiar and shows a very high H. P. in actual test. The arrangement consists of three rings, one 7-16 in. wide by ⅛ in. thick, over which is fitted two rings, each 7-32 in. wide by ⅛ in. thick, with their openings on opposite sides of the under ring, which constantly expands the outer rings, affording perfect compression. Each piston is fitted with three sets of these triplicate rings, in addition to which the wrist pin is held in position by a single ring in a fourth groove, making a total of ten rings to each piston.

Haynes Model O Touring Car.

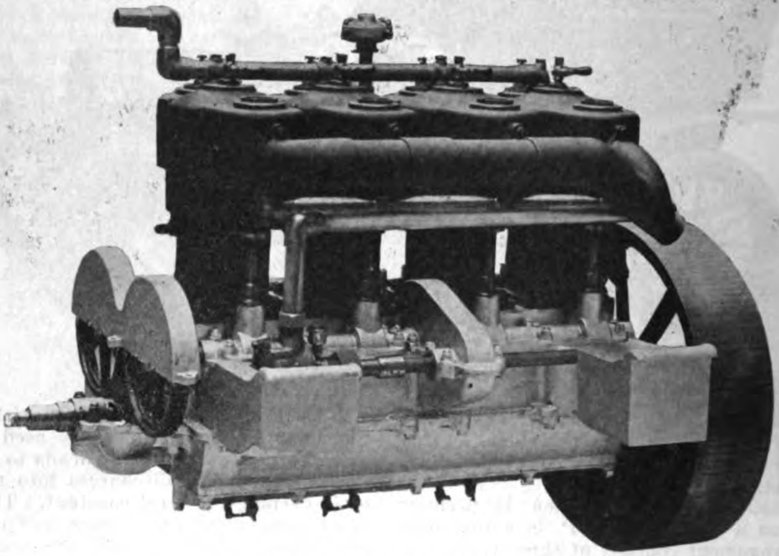


Haynes 1906 Model O Runabout.

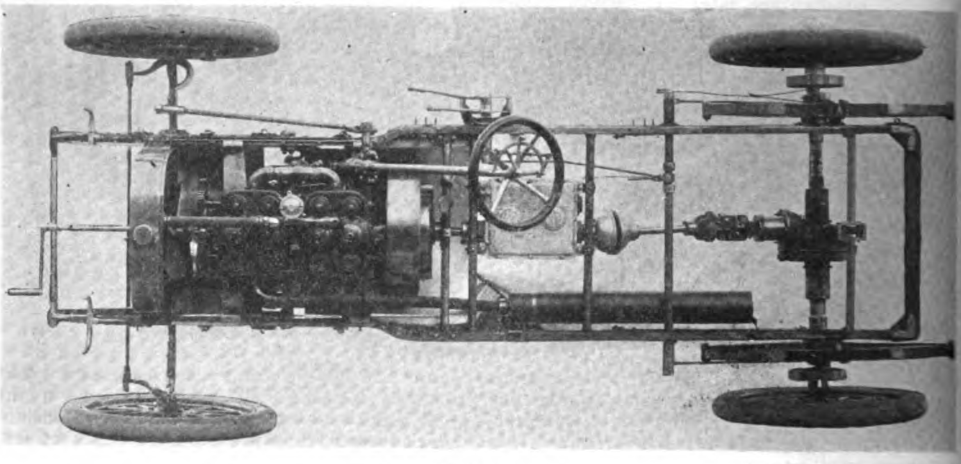
Connecting rods are I-section steel drop forgings. The crank shaft is made from a special high carbon steel specially treated. Its tensile strength is 100,000 lbs.; elastic limit 70,000 lbs. Cam shafts are of drill rod; cams case hardened steel; crankshaft end bearings are of Parsons white bronze; rollers adjustable for wear, the total length of bearings surface on crankshaft, including rollers, being 19 inches.

A mechanical force feed oiler with individual pump to each lead pipe is used to lubricate the engine. One pipe leads to each piston, and one pipe discharges into the crank case, keeping the level constant. The crankshaft, connecting rods, lower half of pistons and cams and cam shafts are oiled by the splash from the crank case pool. The transmission runs in a bath of oil. The universal joints are housed and packed in grease. The housing for the driving mechanism in the rear axle is also packed in grease. Sufficient lubrication is thus provided for a run of several hundred miles.

Ignition is by jump spark, one set of dry cells and one storage battery being used and arrangement made for the use of a magneto if desired. The commutator is housed from dirt and filled with lubricant, and it has a long contact. The circulation pump is gear driven and is powerful enough to throw a heavy stream of water 40 feet through a nozzle. This strong pump effects very rapid circulation through a cellular radiator with large cooling surface. Two fans, one back of radiator, the other in the flywheel, sweeps the air through the radiator and over the engine rapidly, it being confined between the dustpan and the hood. The very large volume of water around the valves also greatly assists in cooling. The pump is simply and strongly constructed. A dustpan of sheet steel extends from the radiator rearward underneath the transmission case. Thus every working part of car is completely housed.



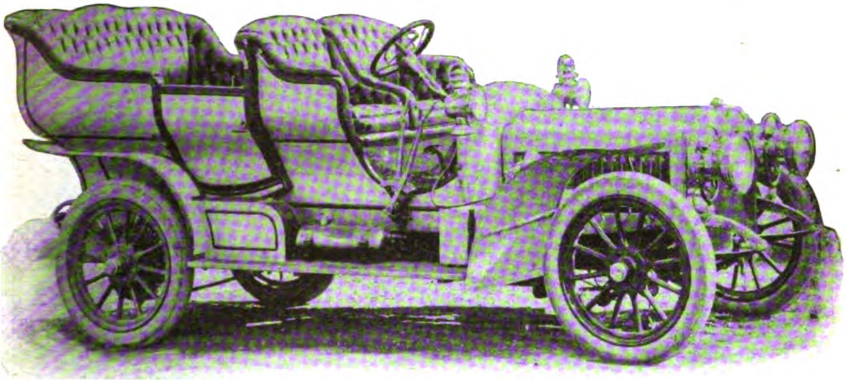
Haynes Model R Engine.



Haynes Model O Chassis.

In constructing the Haynes master clutch they cast from bronze a hub bearing four radial arms, each terminating in a fork. Integral with these arms is a 10¼ in. pulley with a 1⅞ in. face. The hub is turned to a bearing for the end of crank shaft, while the arms extend to the inner rim of the flywheel on which are cast four lugs, one resting between the two prongs of each fork. Very stiff coil springs are fitted, one on each side between the lugs and forks. Revolving loosely around the face of the pulley is a steel band, the hub of which is keyed to the transmission shaft. This band is split crosswise, one end attached to an arm from its hub, the other end to a lever which, when actuated by a cam controlled by the foot lever, constricts the band on the pulley and thus transmits the power from the engine via the lugs on inner rim of flywheel through the springs to the arms, thence to the pulley, which revolves the constricted band and carries the power to the transmission shaft. The coil springs effectually cushion the transmission, driving mechanism and all keys from the shocks and racking effect caused by sudden application of high power, and greatly prolong the life of the machine. The pulley and band arrangement enables the operator to pick up speed without a jar or tremor, it be-

The Thomas "Flyer"



FIFTY HORSEPOWER, $3,500

A FOREWORD

¶ Starting as a pioneer in the automobile manufacturing world the entire force of employees of the E. R. Thomas Motor Company has striven in and out of season with but one resolve before it—to make not the best automobile in America—to make the best automobile in the world.

¶ The demand grew for a high powered touring car as the years went on and automobiles became better understood.

¶ The E. R. Thomas Motor Company was ready to meet this demand. It had been anticipated. The fifty horsepower Thomas "Flyer" had already been launched and the public's choice given to it before that public had found its feet and had decided just what to want.

The
Thomas "Flyer"

" Every stock car guaranteed to show a rate of sixty miles an hour before leaving the factory"

¶ In the Thomas "Flyer" is the most expensive and best transmission placed in an automobile. Four speeds forward and one reverse are its changes. This transmission is of the selective type and the shift may be made from low to high or from high to low without passage through the intermediate gears. The interlocking system absolutely prevents stripping.

¶ The clutch is of the triple metallic disc pattern, the outer discs being of the best grade of manganese bronze and the inner, or driving member, of the best grade of grey iron. The bronze plate is fitted with cork cushions which insure against a jarring, machinery destroying start when the clutch is engaged.

¶ The motor is four cylinder, vertical of fifty horsepower. The valves, on opposite sides of the motor are mechanical and interchangeable.

¶ Fifteen Hess-Bright ball bearings and one roller bearing allow the delivery of the maximum of power to the wheels.

¶ The drive is by double chains, the only method suitable for high powered cars, as shown by experiments and road usage since the construction of automobiles began to reach its present high standard.

¶ The frame is of the best cold pressed steel narrowed at the front and strengthened to a point that prevents breakage or buckling. The frame gives a wheel base of 118 inches and enables the car to be turned in a very narrow radius.

¶ The Thomas ratchet and pawl safety device has prevented more accidents than any other single device ever placed on a car with the exception of brakes. It absolutely prevents a car backing down hill and can be applied without the least loss of power while the car is going at any speed.

¶ The radiator capacity has been increased and is assisted in its function by a fan driven by a chain adjustable to stretch.

The Thomas "Flyer"

"Every car guaranteed to contain all the essential features of construction and workmanship of the best foreign cars."

¶ The Thomas "Flyer" has long been noted for its hill climbing ability. The steepest grades, those that prove terrors for other cars, are taken by it without stress. This is evidenced by the fact that a stock car containing five people recently ascended a 14 per cent. grade at the rate of forty-five miles an hour, as was attested to by them in an affidavit.

¶ In the Thomas "Flyer" America at last has a car that speeds at the rate of sixty miles an hour, fully equipped.

¶ In point of reliability the "Flyer" is unsurpassable. The unequalled workmanship and the choice of materials of the best grade without an eye to expense has brought this about.

¶ The Thomas "Flyer" comfortably seats seven people, two on the front seat, three in the rear seat of the tonneau, and two on revolving collapsible seats in the tonneau. The two collapsible seats are of such construction that they may be folded and placed in a locker in less than a minute.

¶ Owing to the lines of its construction the Thomas "Flyer" has earned the name of the Dust Proof Automobile. All road dirt is deflected, thereby removing one of the greatest annoyances, not alone of tourists but of those who confine their riding to the city streets.

¶ Every ounce of power possible in automobile construction is delivered to the rear wheels. This is accomplished through the fact that more and more expensive anti-friction bearings are used on the Thomas "Flyer" than on any other car and that the double chain drive is used. Especial attention has been paid to the chain pull. On the sprockets this comes directly over a Hess-Bright ball bearing and on the rear wheels between the Hess-Bright bearings.

The
Thomas "Flyer"

¶ Thomas "Flyers" have been the most successful Automobiles in use in America. No detail of construction has been overlooked and the present "Flyer" is the result of years of experiment, study and designing by a corps of high salaried and successful experts.

¶ Every Thomas user is a friend of his car. One man says, "I know now, after having used my car an entire season, why some engineers will insist that their locomobiles have almost *human* understanding."

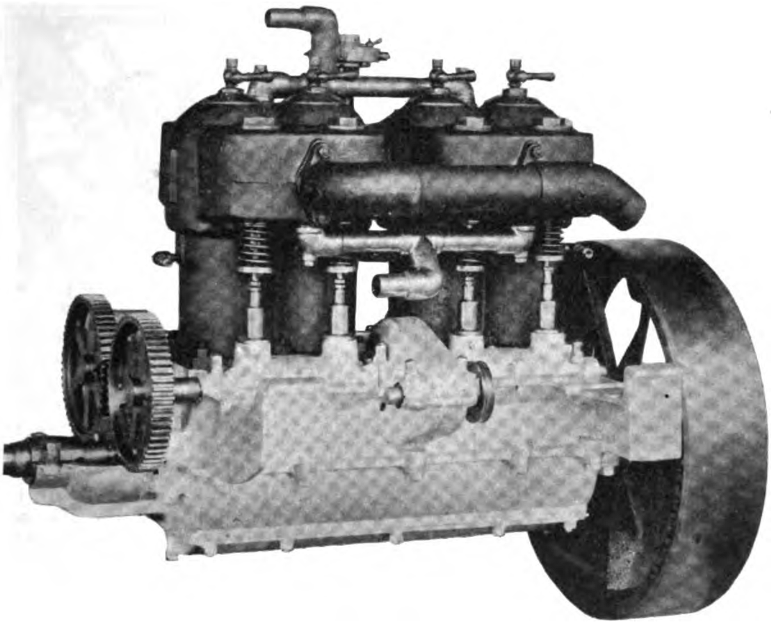
¶ So great has the demand for "Flyers" been that The E. R. Thomas Motor Company found it necessary to construct a new plant—a model of its kind. It is of solid concrete, and with its recent completion cost of operation has been reduced to a *minimum*, a fact through which purchasers are enabled to buy the leading car at a comparatively small cost.

The Thomas "Flyer" is made by

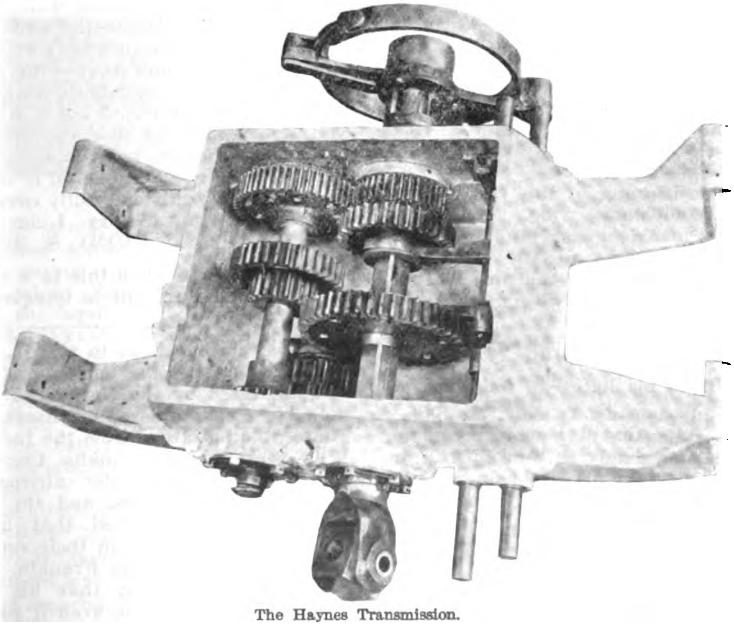
The E. R. Thomas Motor Co.
1190=1200 Niagara St., Buffalo, N. Y.

Member of the Licensed Association of Automobile Manufacturers

impossible to subject the car to a sudden k. Located under the front foot board clutch is readily accessible for adjust- nt.



Haynes Model O Engine.



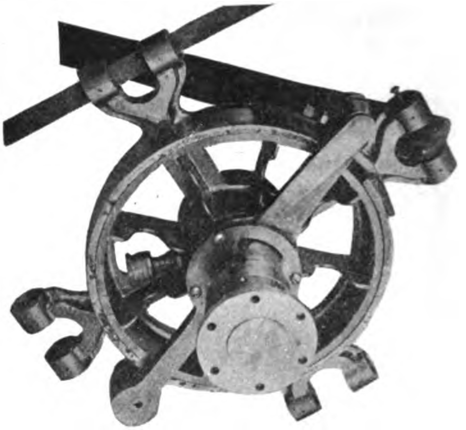
The Haynes Transmission.

his distinctive feature in the Haynes trans- sions is one which assures greater ease perfect safety of operation, and entirely vents the violent shock that would other- e be caused by changing from a high to ow gear.

n the hub of the master gear on the coun- haft is a ratchet and pawl device which permits the car to coast with middle or low gear engaged until the speed of car and engine are equal, when the pawls engage the ratchet and the engine takes up the load. Thus change may be made from high to middle or low gear without any possibility of burring or stripping the gears, for when changing from high to a lower gear the car is running faster than the engine, and the gears running idle may be manipulated by the operator at will.

The universal joints in the Haynes cars are different in principle from those in common use. Two drop forged steel forks with broad flat inner faces are formed; a flat faced square steel block is fitted perfectly between these forks and is held in position by pins running both ways through block and through forks. The driving friction is exerted on the flat inner faces of the forks and surface of the block, no strain being thrown on the pins. Both forks and block are case hardened. It is claimed that this construction secures a much larger wearing surface than can be obtained on pins, thus reducing the wear. The entire joint is encased in an oil tight housin and packed in grease sufficient for hundred of miles. The driving shaft is of special stee 1¼ in. diameter, connected both at transmis sion and axle ends by universal joints.

Haynes Universal Joint.


The Haynes Master Clutch.

13,770 Miles for $7.00.

Some one has called the bicycle "the poor man's trolley car," because so many are used for business purposes and are so satisfactory in such service, but the "motor cycle" has so far been in the eye of the public mostly as a pleasure vehicle.

Many people know that young, active men can make fast time and go long distances on them, but few know how really practical and satisfactory the modern perfected motor bicycle is for regular business service day in and day out and all kinds of weather.

Physicians and contractors are using them in many places with great economy over horse-drawn service. Economy both in expense and time and taking roads that no other vehicle, horse-drawn or motor-driven, would attempt.

A remarkable instance of this has come to our attention and shows what can be done with the little machine with intelligent handling. Fred. S. Roberts, of Mt. Vernon, N. Y., purchased a second-hand machine in June, 1905, and from July 1 to November 15 rode it 13,770 miles, or about ninety miles per day, at a total expense of $7.00, and saved in that time $459.00 in railroad fares.

We quote from his letter as follows:

Mount Vernon, N. Y., Nov. 21, 1905.

I can only state that I bought my motor bicycle purely and simply as a business proposition and as my territory as business agent I must cover all that portion of Long Island included in Queens and Nassau Counties, and in addition the Borough of Richmond (Staten Island). I find the condition of roads fairly good and it is rarely that I did not cover from 90 to 100 miles every business day since on or about July 1, 1905, which you can readily see would make my total distance covered enormous. To be sure, I have taken great care of the machine, same as one would of a fine horse, and that's why I was enabled to put my "Indian" to such severe tests. Firs thing I did was to study the machine an understand why and how each and every par worked, being an electrician and a mechani I naturally pursued this course, and after was a master of "compression," "intake" an "exhaust" valves, spark plug education, etc etc., I was enabled to go at a high or lov rate of speed (medium speed is best for ai cooled engines), and thus get over an in mense territory and not be obliged to pa excessive railroad fares or wait long period for trains or cars—it, to the writer's opinion is purely gross ignorance that breaks down good many machines that with proper car would last for an indefinite length of time I might state also that I am a man weighin 180 pounds and the machine just walks u any old hill just as easy as if it were goin down. Virtually good solid oil is cheaper tha parts. Wishing this may fully cover all point in your letter of inquiry, I am most trul yours, FRED. S. ROBERTS.

A better tribute than this to a worthy art cle it would be difficult to imagine.

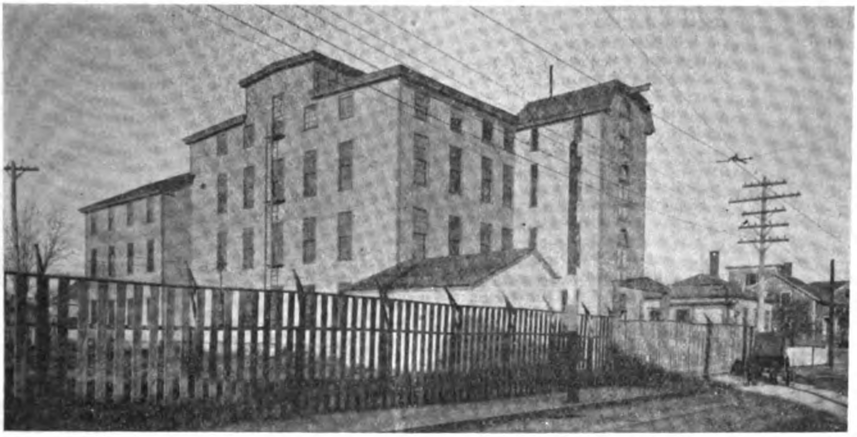
A favorable decision to the H. H. Frank lin Mfg. Co. was the outcome of the recen suit instituted by the New York Automobi Co. The complaint was dismissed with cost The contention arose from the fact that Joh Wilkinson of the Franklin Co., is the i ventor of the 4-cylinder air-cooled engin used in Franklin cars, and the New Yor Automobile Co. claimed that he had o tained his ideas while in their employ befor he was engaged by the Franklin Co. Judg W. S. Andrews held that his immatur thoughts were his own, even if gained at th expense of the New York Automobile C and that as he had not used any of the designs, models, patterns, etc., they had n case against him or the company with who he is connected.

The Maxwell-Briscoe Co.'s Wonderful Record.

Probably the most wonderful success in the utomobile industry is that attained by the Iaxwell-Briscoe Motor Company, of Tarytown, N. Y.

This company was organized and took posession of their present plant at Tarrytown, I. Y., about a year and a half ago. With no lare of trumpets, but with a steady purpose hey immediately settled down to make a car which should be representatively American, a ar that would "get there" at the lowest posible cost of maintenance.

That they have been successful in doing o is evidenced by the fact that from the day f inception to the present time thousands of heir cars are their salesmen for the coming ear. The name Maxwell has indeed renered synonymous with Reliability, so that ow this firm in point of output (after a usiness life of little more than fourteen nonths) stands sixth or seventh among the orld's largest automobile manufacturers.



Maxwell-Briscoe Motor Co.'s Providence Factory.

The success which has attended these cars as rendered self-evident the fact that the Iaxwell output could not keep pace with Iaxwell sales. Realizing the absolute necesity and the equity of taking care of their gents, the Maxwell-Briscoe Motor Company arly this year began agitating the question f increased facilities for 1906. With this in nind they have obtained two plants addiional to the one at Tarrytown, which will emain the headquarters of the company: ne at Chicago, Ill., and the other at Pawucket, R. I.

The magnitude of this company may be atributed to one thing, the individuality of its nembers. Bringing to the firm an experience nd judgment ripe and mature, after years of tudy and experiment, Mr. J. D. Maxwell has triven to maintain his record of efficiency and hat of the product with which his name is ndelibly associated.

His has been the slogan, "One Dollar of Reliability for every Dollar of Cost." To im has been due in largest measure the astounding fact that the only features in which 1906 models of the Maxwell will differ from those of 1905 are insignificant details. Taken in connection with the fact that in 1892 Mr. Maxwell brought out in his home town, Kokomo, Ind., one of the first practical automobiles built in the United States, it proves that he has indeed "builded better than he knew."

The president and general manager of the company is a man whose name has been intimately connected with automobile parts for many years, Mr. Benjamin Briscoe. Together with Mr. Maxwell, he has assisted in showing by the "deadly parallel" how simple and perfect the Maxwell cars are in themselves.

During the 1906 season, the Maxwell-Briscoe Motor Co. will have eight models on the market instead of the two with which they started. When it is considered that these immense strides towards success have all been taken in a year and a half, one is left to marvel at the resourcefulness and intelligence which has so ably directed the movements and policies of this company.

The Tarrytown, N. Y., plant of the Maxwell-Brisco Co. with its splendid equipment is familiar to our readers having been previously described in these columns. The Chicago plant which we here illustrate has 60,000 sq. ft. of floor space, running from Seventy-third to Seventy-fourth streets, at Grand Crossing.

The new plant will have a capacity of 1500 machines. The method of the Maxwell-Briscoe Company will be to ship the parts from its Eastern factories at Tarrytown and Pawtucket and have them assembled for the Western trade at Chicago. The move was made on account of the heavy railroad rates. The company desires to give its western agents the opportunity to secure machines quickly and with comparatively little freight expense, to enable them to compete more effectually with the western factories.

The Pawtucket plant which we also illustrate will be used exclusively for the assembling the Model L Tourabout and is fitted up on the basis of turning out 2500 cars at this point in connection with the work that is being done for this company by Brown & Sharpe and the Providence Engineering Works—two concerns which are devoting large portions of their plants to the production of Maxwell engines, etc.

THE MAXWELL 1906 LINE.

The Model L or tourabout car, of last year is continued substantially as in 1905. It has a 10 H. P. opposed motor under hood; shaft drive with nickel steel gears throughout. The changes that have been made have been just those of the refinement of the parts. The success this car as well as that of Model H was such that it involved too great a risk to make any changes in them.

The Model H 16 H.P. Touring car is substantially the same car as the 1905 model, with the substitution of nickel steel in the gears, and a new system of adjustment on the main bearings, which can now be adjusted from the outside of the motor case, the boxes being backed up by wedges which are controlled by adjusting screws projecting through the aluminum case.

tires. Length of body five feet. Carry capacity 1500 lbs.

One of these delivery cars is being used the Croft-Wilbur Company of Philadelp and we understand from them that three months' service this car has only b out of commission for about forty minu and it has been used continually, and been used by their traveling men to t long trips throughout the State.

There will also be a two ton Maxwell tr which will be ready for delivery about A or May. A few of them, and a brief desc tion of one of them was printed in th columns, and the results being accomplis are extremely satisfactory, and lead makers to believe that they have solved gasoline motor truck problem.

The newest Maxwell will be a four-cylir car which will be ready for the show, an which they will be able to make delive early in the Spring. The cylinders are cast separately—the motor case and tr mission case are substantially of one p

Chicago Assembling Plant of the Maxwell-Briscoe Motor Co.

Roller bearings are substituted for certain of the plain bearings that were used last year in the transmission. The body of this car has been changed giving it a longer appearance to conform to what is believed will be the most popular style for 1906.

A new car on the lines of the tourabout with divided seats and flat rear deck has been added, which is styled "The Gentleman's Speedster." This is a car for those who want a speedy, sporty runabout.

This car will have a speed of practically a mile a minute. It is a car that will be very popular with the owners of large high-powered cars, those who are accustomed to very rapid traveling, for in the matter of economy it will save the wear and tear on the car and on the tires of very high-powered high-priced machines, at the same time giving as great a speed and as sporty an appearance.

A limousine car made on the Model H chassis is an other addition, it being constructed as an adjustable limousine body, to be taken off and put on at a time expenditure of not over half an hour.

A delivery wagon of new design has been added, the specifications for which are as follows:

Motors double opposed horizontal, five by five. Shaft drive. Either pneumatic or solid

so that the three-point suspension sys which has been a distinguishing featur Maxwell cars, will be maintained in the f cylinder. It will be shaft-driven, 32x4½ t —104 inch wheel base.

The body of the car will be made as ro and as handsome in design as any car at price. This car is now about tested out apparently will sustain in every particular splendid record made by Maxwell cars du the last season.

It develops over forty horse-power, and finish and equipment will be of the v finest. The price has not yet been set upon, but they are striving to bring it dow the neighborhood of $3,000.

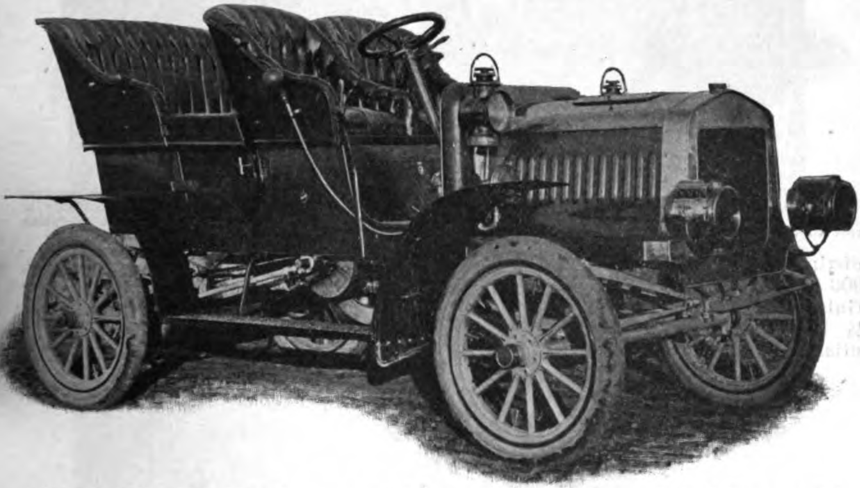
The list price on Maxwell cars the con year will be: Model L, $780: "Gentlem Speedster", $800: Model H, $1450: Limous $2,000: Dr. Maxwell (a runabout car b upon a Model H chassis), $1250: 1500 delivery wagon, $1400.

On page 444 you will find subscrip blank of the CYCLE & AUTOMOBI TRADE JOURNAL. You cannot affor miss a single issue. Fill out the blank mail it at once, with $1.00.

The Gale 1906 Automobiles

HUGH DOLNAR.

he Western Tool Works, Galesburg, Ill., S. A., capitalized at $200,000, incorporated 1900, took up motor cars the next year, had its first automobile on the road in 1; this was a four-cylinder vertical motor, lt on a sub-frame and shaft and bevelled r driven. It was experimented with until e, 1902, when another car was built drivby a pair of horizontal opposed cylinders, ins., 4-cycle, water-cooled. It had fric- clutch speed gear selection, two forward eds and reverse, chain to divided rear e. The motors on this car were under the ward foot boards and tanks were under hood. Two of these cars were placed the road late in 1903, but this type was continued. The third type of Gale car s placed on the road late in 1903; this was runabout with a vertical 5x6 in. motor der the hood. It had a spur planetary r and was shaft and bevelled gear driven. is third Gale model was also laid aside er a course of experiments and, January 1904, the Gale Co. began a new car, a nabout, driven by a horizontal single cyl- der 4¾x5½ in. motor, friction selected gear, o speeds forward and reverse. This car well and was sold, but not continued in nufacture. In May, 1904, began a fifth del of runabout, wheel base 72 in., wheels x3 in., motor a single horizontal 5x6 cyl- der, water-cooled, with a spur planetary ar, two speeds forward and reverse. This del had the tilting body which all Gale s since then have been supplied with. It s placed on the road in September, 1904, s regarded as satisfactory, and 20 of these gle cylinder runabouts were made and sold that year.



1906 Gale Model E, 18 H. P., 5-passenger touring car; wheel base 92 inches; wheels 30x3½; gauge 56 in. The hood houses a 15-gallon fuel tank, a six-gallon water tank and two sets of dry batteries. Large locker with rear locker door under tonneau seat and a considerable storage space under the front seat. Motor, a pair of 5x5 horizontal opposed cylinders, spur planetary speed change to through rear axle and sleeve, two forward speeds and a reverse; weight 1700 lbs.; price $1250, including mats, dash horn, two genuine Mangin mirror gas lamps and generator, two oil side lights and one oil light and full equipment, all ready for extended touring. The top irons are fitted to every body sent out, and this car can be obtained with full cape top, storm front and side curtains, as Model F, price $1325.

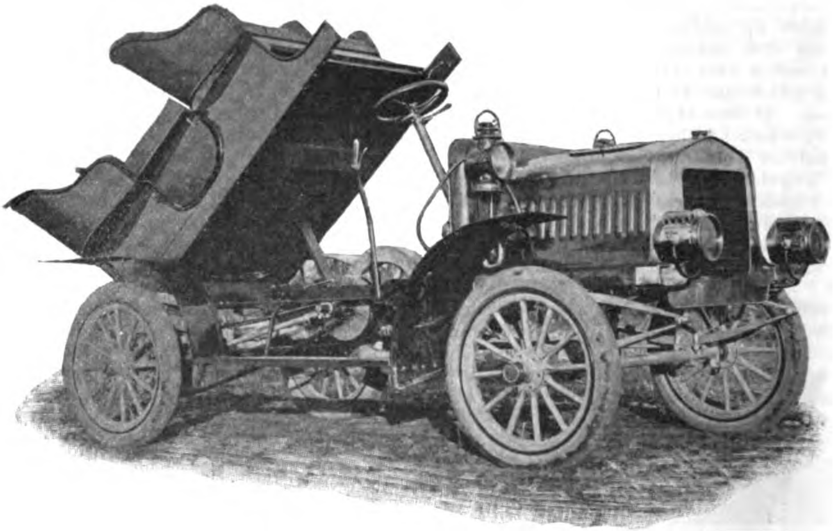
'or the season of 1905, the Gale Co. was contented to make detailed improvements in the 1904 single cylinder runabout model. The car was described in these columns and exhibited at the 1905 Chicago show, and orders for all the factory could produce and more, were booked. The advantages and ease with which the body could be tilted, were a constant source of interest. These 1905 Gale cars did very well indeed, and will be continued in 1906 with changes in the gear, muffler, steer and control. Roller bearings on the rear axle will be added and a selection of any standard clincher tire is offered. The 1905 model A Gale runabouts were sold at $500, including single tube tires, but no lamps or horn; and at $554, including clincher tires, lamps and horn.

This single cylinder Gale runabout, with the added improvements, will be offered for the season of 1906, at $600, with choice of any standard tire, and $650 with a cape top.

In 1905 the Gale Co. began the construction of a new model detachable, side entrance tonneau, tilting body car, which was placed on the road early in October. This was a more pretentious car carrying five passengers, and driven by a pair of horizontal opposed 5x5 in. cylinders, heavy spur planetary speed change, and heavy chain drive to through rear axle and sleeve. Orders are booked for 1906 deliveries of this, which is satisfactory to its constructors, being a large and roomy vehicle, strongly driven and fast. It is not built on any new and untried line, but is simply a development from the runabout and contains all the good points of the latter.

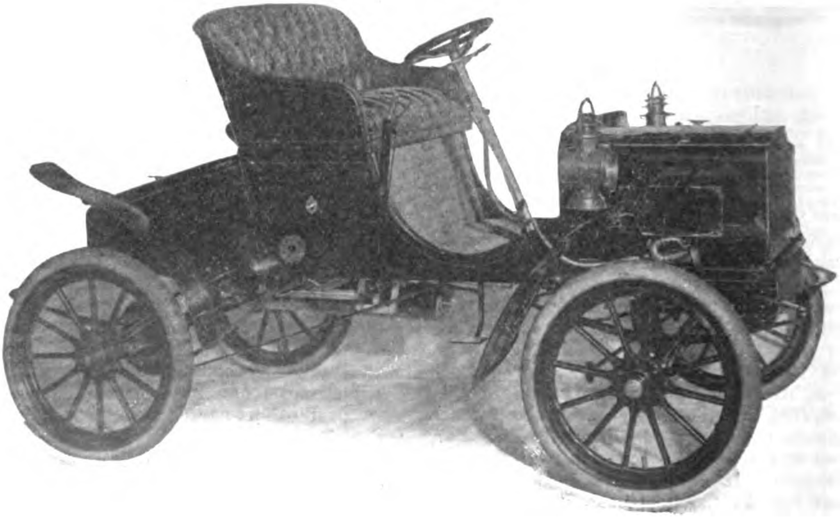
THE TILTING BODY.

The tilting body hinged at the rear end of the sills, and readily lifted and supported at such angle as to give free access to all the machinery of the car, is extremely convenient in many ways, and is an inexpensive and substantial construction, which has not, however, been much used, and is therefore one of the distinguished features of the two types Gale 1906 cars.



1906 Gale Model E, 18 H. P., 5-passenger touring car with body tilted up, giving access to entire motive system. This makes the most ready inspection and adjustment of running parts possible. The body is also easily removed and replaced. There is nothing attached to the body, neither wires or operating levers to disconnect.

The Gale chassis frames are of angle steel, 2½x2x¼ in. wide member vertical inside. Substantial hinges are applied to the body sill, rear ends, and to the chassis frame, rear ends, so that the tilting body is extremely well supported on the chassis frame when tilted. When down, in running position, t body sills are close outside the vertical chass frame member, and are secured in front two bolts, which with the hinges at the re and the chassis frame vertical members, w support the body when down.



1906 Gale Model C, 8 horse power runabout; wheel base 73 in.; gauge 54½ in.; wheels 28x3 in.; motor, 5x6 in.; single, horizontal cylinder; spur planetary speed change to through rear axle and sleeve, two forward speeds and a reverse. Fuel tank five gallons, water tank four gallons and large tool box are under the hood. At the extreme back end are the batteries, coil, plug and carburetor, and one deck door hinged to back of seat, gives easy access to all. A short chain is used, and consequently small chain vibration, thus reducing chain wear. Weight 1100 lbs.; price $600, including mat, dash horn, two oil side lights, tool kit, and choice of any standard tire. Model D, with three bow, cape top, storm curtains and storm front, $650.

There is no question whatever, as to t great convenience and value of full acce to the entire machinery of the car, by lifti the body off the chassis frame. The atten ant can stand on his feet beside the c everything in full view, and give any part e machinery any needful attention, which more than can be truthfully said of many her forms of car.

When raised the body is supported by a op, making all secure, and the rear hinge sition in the five passenger car, nearly in e vertical mid-plane of the seat cushion, ves the tonneau a balancing overhang, nich makes it even easier to tilt the large e passenger than the runabout body. Both dies are easily removable by taking out e hinge bolts, and as nothing is fastened to her body, the chassis can be tested on the ad if necessary without the bodies.

The Galesburg factory buildings are comodious, occupying 130,000 sq. ft. of floor ace, and the equipment of the Western ol Co. is of the best, the plant having been t down to build fine machine tools. Now at the Gale cars are finally, after so many als, brought in to what the Gale Co. rerds as thoroughly satisfactory form, it is pected the entire resources of the establishent will be taxed to the fullest extent to pply the demands of 1906 purchasers.

BRAKES.

There are 10 in. external drums applied to ar hubs, with fiber lined bands. The two nds are connected by a cable through a nt tube, thus equalizing them. The large right hand pedal applies these brakes only, and is ratchet held. The large left hand pedal applies the reverse and may be used as an emergency brake.

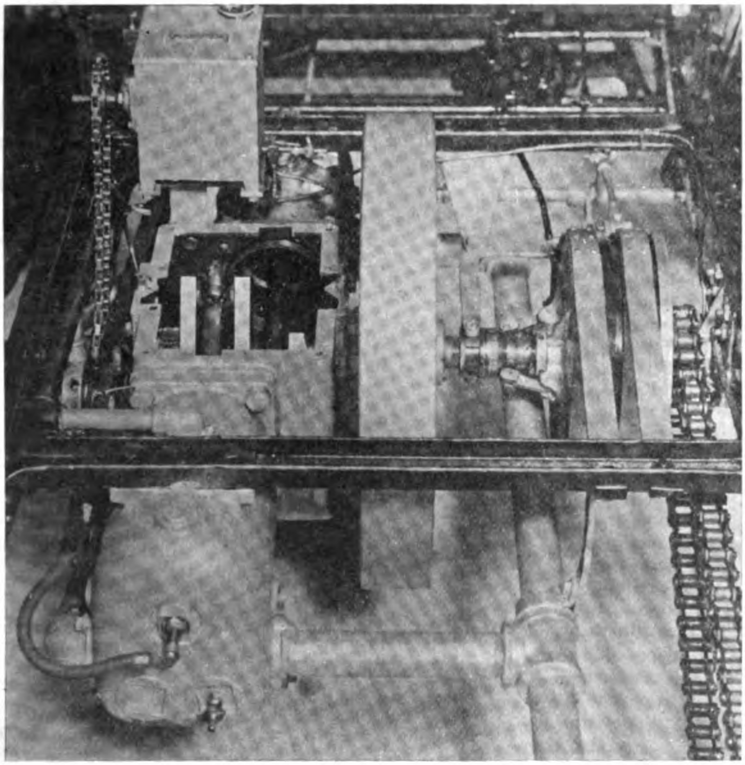
CHASSIS FRAME.

This is angle steel, 2½x2x2¼ in. Channel steel cross members, are flush, giving a flat job. No castings are used on the frame. The rivet holes are drilled and reamed and the frames are hot rivetted. Cylinders are fastened under two channel steel cross members. A secure lock is provided for the tap bolts holding the cylinders. The chassis frame width is 34 in. It is parallel, 108¾ in. long.

SPRINGS.

Four full elliptic springs are fitted to all Gale cars.

The touring car springs are 36 in. long, 2 in. wide, six leaves in rear and five leaves in front, leaves grooved and banded on top. The front springs are mounted directly under the horizontal frame member and are clipped to it. The rear springs are provided with a trunion, which is continuous from side to side. This trunion is movable so that springs can be kept square when strut rods are lengthened to tighten chain. The trunion is hot forged steel, and exceptionally strong. use of wide full elliptic springs, not only



Gale 5-passenger car, motive system, crank box cover removed; nothing is fixed to the crank box cover. The change gear bands are fibre lined. The shaft is in half boxes in the crank box and in a bushed bearing next the sprocket. The Hill precision oiler is chain driven, and makes oiling positive and in absolute proportion to speed. The heavy single chain is at extreme right of frame, immediately next to crank and axle bearing. Change speed levers are simple and effective. Secondary wire is led down a conduit to protect from oil and dirt. The three plugs in cylinder head are interchangeable, spark plug can be placed as shown or over either valve.

gives easier riding qualities but greatly diminishes breakages.

The struts are straight and parallel, tubular, ball ends, and lie in the crank shaft and rear axle plane, square job, direct resistance.

AXLES.

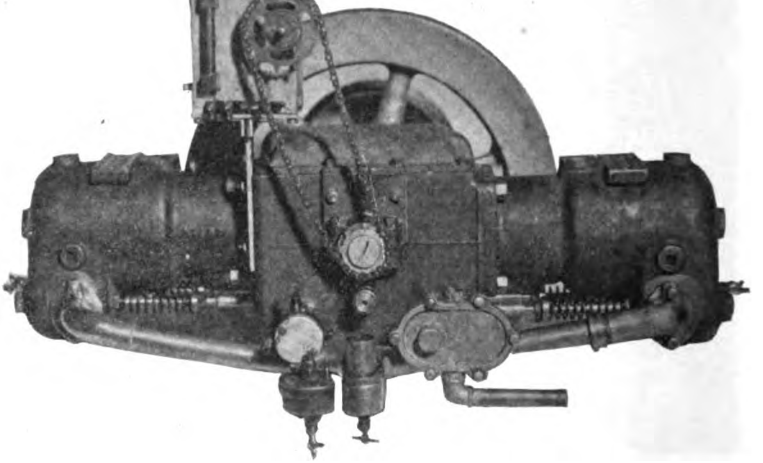
The rear axle sleeve is Shelby steel tubing, 2¼ in. dia. and short; the through axle, also Shelby steel tube, is 1¾ in. dia. Into the ends of this through axle, are electrically welded studs. The nuts and washers which go on these studs, hold the wheels on securely. Into this hollow axle are drilled several oil holes feeding the sleeve, bearings and differentials. One large feed oil hole is provided conveniently in the center of the axle, and it may be filled with oil, thus making frequent lubrication unnecessary. Warner No. 4 spur equalizing gear is used. Axles all run on long Hyatt roller bearings, and in addition ½ in. ball end thrusts are provided to further eliminate friction.

retained and can be handled without loos
ing the hand from the rim of the wheel.

All Gale cars are noted for extreme s
plicity of construction. The use of the few
possible number of pieces is a distinct
feature. The car which contains the few
number of pieces, will undoubtedly prove
be the easiest taken care of. As great c
is taken to see that each of these parts
amply strong, a serviceable, powerful a
easy operated car is the result.

The motor is set lengthwise of the cha
frame, close to the left inside member. T
sprocket to the equalizing gear on the r
through axle and sleeve is placed close to
right hand inside of the chassis frame. T
makes the axle sleeve short, which is
advantage in weight and labor, and a
brings the chain pull close to the suppo
of the transmission shaft and rear axle.

In the complete view of the Gale 1
motor it will be observed that both the ti



Gale opposed cylinder motor. Cylinders 5x5 in.; cylinders bored and reamed; pistons ground, free fit; three ⅜ ground rings, back of pin, three oil groover at open end; piston pins 1 in. diameter, hardened and ground; connecting rods, steel drop forgings; solid bronze bushings forced in piston end; full marine type on crank wrists, bronze half boxes, single liner 1-16 in. thick on each side; caps held with studs and one castelated nut and pin. Hill precision oiler, four leads, chain driven from crank shaft, and supplying the whole motor. Crank bearings and wrists all 1⅜ in. dia. Lubrication of crank shaft and wrist from Hill precision oiler, groove in journals, oil holes in crank shaft and arms to crank wrist. Pistons grooved on top, oil hole to piston pin; supplied by Hill oiler. Cam shaft bearings, fed by cast pockets, filled by excess oil thrown from crank. Integral crank box, cam shafts in long bronze bushings. Cams in dual held by one taper pin. Two cam shafts of large diameter, one for each engine. Valve action all direct, no offsets, valve lifters ½ in. dia., valves and lifters both in bronze bearings 3½ in. long. Valves and stems integral nickel steel, valves and stems soft and no adjustment in valve rod length. Cam rollers and pins hardened and ground, rollers one inch dia.; ports all the same, 1½ in. dia. and valve chamber 1⅜ in. dia. Compression 85 lbs. gauge; nominal 18 H. P. at 1000 R. P. M. These engines run well at 1500 R. P. M. Full access to valve action, by taking off crank box cover, which carries nothing. Large heavy fly wheel insures smooth running motor. Circulating pump bronze, two pinions, direct driven by cam shaft. Ignition jump spark and two dry batteries, double dash coil imported spark plugs, and immunity cable, conduit protected. Timer at side of car easily reached from running board.

The front axles are 2⅛ in. Shelby steel tube, electrically welded to large yokes. The front wheels run on ⅝ in. ball bearings and the knuckles are large and carefully machined. The wheels are the best product of the Salisbury Co., have 1¼ in. spokes and are an exceptionally good job.

STEERING GEAR.

This is a Gale home construction, worm and worm gear sector, adjustable for all wear, and all encased, and provided with ball steering rod joints. 1¾ turns of wheel for full sweep. The throttle and spark levers are conveniently placed under the wheel and swing same as the wheel. They are ratchet

and carburetor are conveniently placed. B
can be inspected and adjusted without op
ing any trap doors in the floor or tilting
body. They also can be adjusted from
running boards while the car is in moti
The water pump also can be removed,
necessary, without disturbing any other p
tion of the motor or frame.

CONTROL.

This is by one outside hand lever, t
large vertical pedals and one small plun
pedal for muffler cut-out.

The lever controls the gear, rear posit
for high speed, middle neutral, and forw
for low gear. This lever is latched t

notched quadrant in low speed engagement, and band wear can be taken up by advancing a notch. The latch also provides a stop in going out of the high speed at neutral. Excessive band wear can be taken up by an adjustable band rod and the hand lever brought back to its original position. This construction makes it unnecessary for a driver to stop on a bad hill to make cam adjustments.

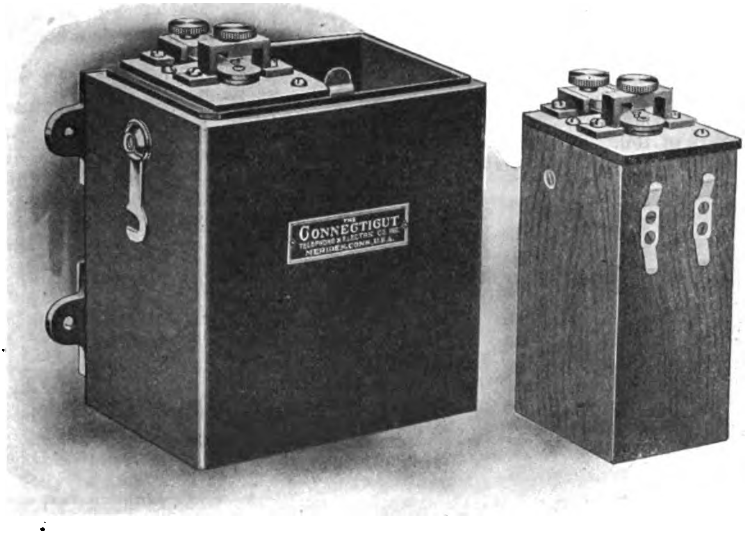
ON THE ROAD.

Hugh Dolnar met with an accident and was laid up in the Moline, Ill., hospital with a broken leg and therefore was unable to make his usual demonstration ride in a Gale car, but the day that the above story was written a Gale model E touring car made the trip from Galesburg, Ill., to Moline, Ill., and return over a roundabout road (because of bridges being impassable on Rock river), covering about 150 miles, in the total running time of 8 hours, carrying 3 passengers. This included many stops for restive horses and was over ordinary dirt roads and some very hard hills.

The Connecticut Spark Coil

E. S. FOLJAMBE.

The Connecticut Telephone and Electric Co., of Meriden, Conn., are just placing on the market a new spark coil for automobile work called the "Connecticut Coil." This coil will doubtless attract much attention from automobile builders and owners, as very strong claims are made for it. The average coils can be adjusted by test to run successfully on as low as 1¼ amperes, while the average coil as adjusted by inexperienced operators uses anywhere from 2 to 4 amperes. In fact, in many cases, the consumption is so great that dry cells deteriorate too rapidly to be of much value, and magnetos or storage batteries are substituted. This coil has been repeatedly adjusted with the engine running to operate on from ¼ to 1-10 of an ampere. These tests were made by use of an especially adapted ammeter with a plug which can be inserted in place of the ordinary switch plug while the car is in motion.



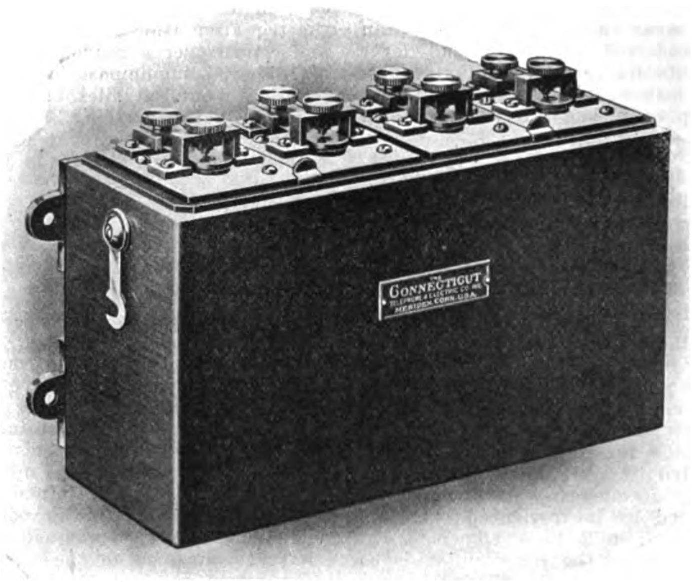
The 2-unit Connecticut Coil with One Coil Removed, showing spring contacts.

It will be seen from the accompanying photographs that the external appearance of the coils are quite similar to others, with perhaps the exception of being probably more compact. Each coil is a separate unit, and may be instantly removed from the box by simply lifting it out, it not being necessary to unscrew or disconnect anything. Upon replacing the unit in the box all connections with the battery and secondary are automatically made by spring contacts. As shown on the coil that is removed the springs are double and positive contacts are thus assured.

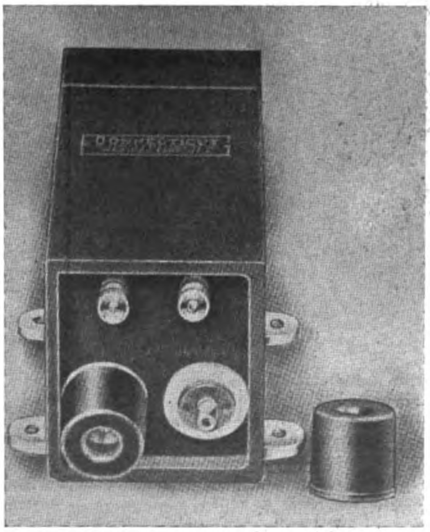
By slightly rounding the upper back edge of the unit top, the coil is made to snap forward into position, thus pressing the double end springs into tight contact with the metal surfaces connected to the wires. A heavy spring holds the coil unit down in position, but when the coil is removed the rounded upper end of this spring is forced to one side.

GENERAL CONSTRUCTION.

The core is made of the best soft Norway iron wires, and is tightly incased in a tube or sleeve of insulating fibre which effectively binds it into one compact unit. The primary and secondary windings are of a greatly improved type, great care being taken to properly insulate them. Mica is used extensively for this purpose in preference to waxed paper. The details are worked out carefully, so that in assembling the parts it is not necessary for the ends of the secondary winding to be drawn across the end of the core, which has led to trouble on some coils.


The 4-Unit Connecticut Coil.

The condenser has a large capacity and is made of only two pieces of foil, folded like a bolt of cloth in such a manner that two layers of insulating onion skin paper separate the layers of foil. The foil does not reach the edge by about ⅝ in., which insures complete electrical separation of the layers. All moisture is carefully driven out and the whole dipped in a melted compound. A screw press is used, and pressure enough obtained to form the whole into a solid mass without any injurious air gaps. The result is a condenser measuring only ¼x1¾x4⅛ in. The core windings and condenser are placed in a wood cas with a rubber top carrying the vibrato spring bridge and contact screw. This uni is only 5¾ in. by 2½ in. by 3 in.


Bottom of Connecticut Single Coil with one cap removed

SPECIAL FEATURES.

The contact screw is self-locking in an position by means of a patented device, a shown in the accompanying cut. A recess i the under side of the bridge contains a smal coil spring "A," Fig. 1, which is pressin downward on the small hexagonal nut "B, through which the contact screw is threade Nut "B" cannot turn as part of its depth, fi into the hexagonal hole in the under side o the bridge. The pressure on the nut "B wedging it against the threads gives a fri tion lock which allows the adjusting scre to be turned any desired amount, and yet i sufficient so that the setting will never ja loose. In this way notched rings which giv only approximate adjustment, small bindin screws, and the necessity for screw drive are avoided. The tension on the spring is d

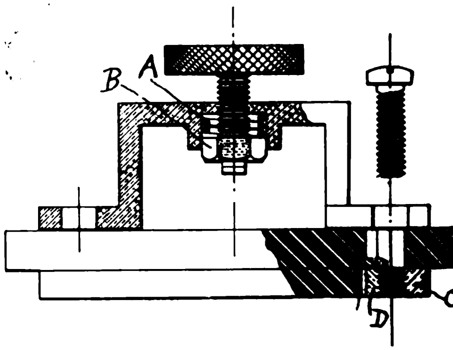


Fig. 1. Connecticut Coil.

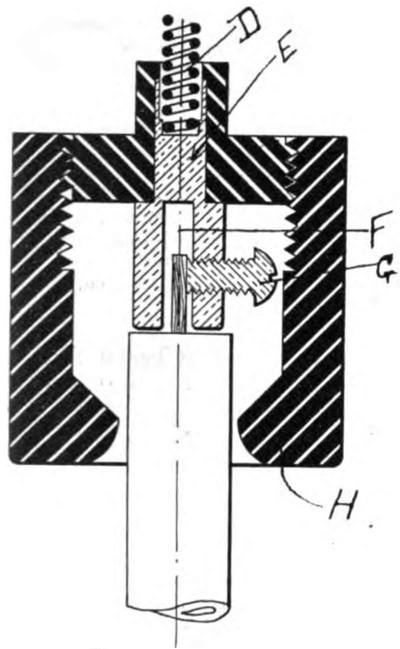


Fig. 2 Connecticut Coil.

ined by the amount it is compressed by
ing nut "B" against it, and then screw-
in the contact screw. This tension re-
ns constant no matter what the position
he adjusting screw may be. The screws
ch hold the body in position do not make
tact by having wires under their heads as
al, but screw into small brass bushings,
" as shown in the cut. The bushings are
ed and a wire passed through them, and
er the head of a small screw D as shown,

which makes contact with the bushing so that the bridge screws may be removed without twisting or disturbing the wires. The simple method of attaching the secondary cables at the bottom of the coil will be appreciated by assemblers.

The accompanying cut, Fig. 2, shows the small coil spring "D," which makes the secondary contact with the plate on the bottom of the coil unit. The lower end of the spring is held by forcing it into the slightly smaller lower end of the hole in the brass piece "E." The insulation at the end of the cable is cut back and the wires slightly soldered and pushed straight up into the tube "F," where the set screw "G" holds them. The cap "H" can now easily be screwed over as a protection, as the wires of the cable are not twisted, distorted or bent almost to breaking as is so often the case. Fig. 3 shows a complete cross section of the top and the method of holding the flat vibrator spring.

The spring has a rolled temper, some twenty different makes were tested before a satisfactory one was found. It is capped with a disc of the softest Norway iron. The contact points are tipped with platinum iridium alloy. The bottom outside of the case is extended downward to form a kind of shield or apron to protect both the primary and secondary terminals from moisture or wet, preventing part or complete short circuiting, which is extremely hard to locate under these conditions.

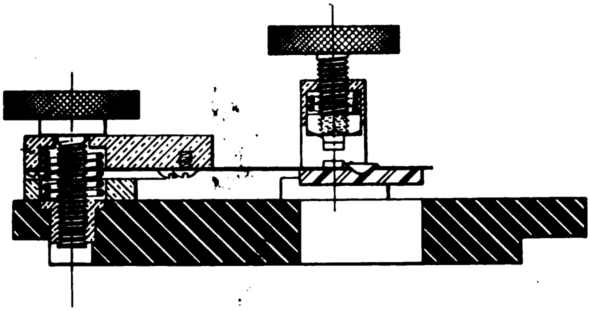


Fig. 3. Connecticut Coil.

Not only is this coil very efficient, but the spark, or more strictly speaking, the flame produced from same, is exceedingly hot; in fact, so much so that No. 20 iron wire is melted almost instantly and a piece of wood an inch square was fired in less than five seconds. These results are accounted for principally on account of the great efficiency of the coil and its great rapidity.

Manhattan Automobile Heater.

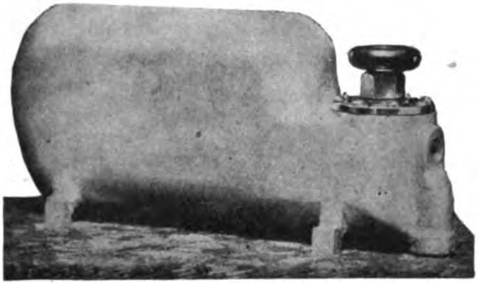
is device for heating the interior of closed
gasoline automobiles or used as a foot
mer on open cars manufactured by the
hattan Automobile School, 315-321 W.
ety-sixth street, New York City, requires
attention, can be removed when desired
costs nothing to operate, as the fuel is the
ed water from the engine, and for this

reason also there is no danger of fire. The body of the heater is a compact aluminum casting, 16 inches long, 7 inches high by about 3 inches thick, in the standard size, and rounded at the edges to give a smooth and neat appearance. The feet for attaching to the car are placed at the side, top or bottom, to suit conditions.

A specially designed valve is placed at one end, into which the supply and discharge pipes lead. The valve is so made that the heating water can be turned off or on by one-quarter revolution of the handle, and intermediate positions give a partial supply of hot water.

The circulation of water in the cooling system is not interfered with in the slightest degree by any position of the valve, which is within easy reach of the passengers, who can regulate the degree of temperature at will.

Freezing is prevented when the heat is turned off by the water circulating through the pipes attached to the heater. Enough heat is supplied in this way to keep the heater just warm.



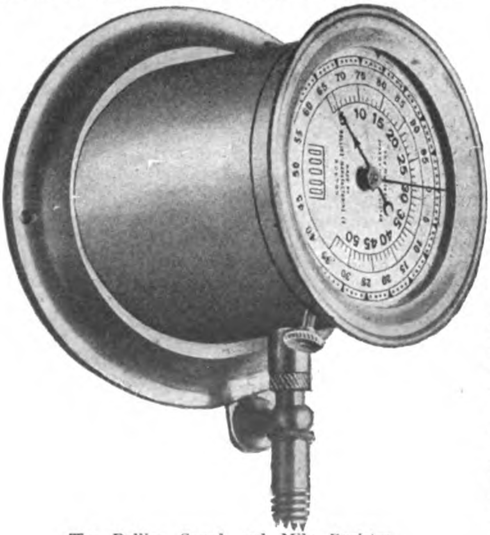
Manhattan Automobile Heater.

The slight wear on the valve, which may come with long use, does not allow leakage, and no repairs or refitting are ever necessary. Drainage is provided for in such a way that when the water is drawn from the other parts of the system the heater drains itself.

The fittings are of nickel-plated brass, therefore no part can corrode and interfere with the proper working of the device.

The Rollins Speed and Mile Register

Rollins Mfg. Co., Park Square Motor Mart, Boston, Mass., have on the market a new speed indicator and mileage recorder. This instrument besides indicating speed also registers trip and season mileage. The trip mileage indicator can be turned back to zero instantly without disturbing the total mileage register. All parts are made of heavy brass and the construction throughout is both simple and strong. The instrument is attached to the dashboard and actuated by a flexible cable and a gear attachment on the car wheel. The cable is made of first-class material and covered with a brass flexible tube, which is both dust and water-proof. Accuracy and durability have both been borne in mind in designing and constructing this instrument, and it is claimed that it registers accurately under the roughest usage. Three sizes are made, 3½ inch, $65; 4 inch, $75, and 4½ inch, $85.



The Rollins Speed and Mile Register.

Pennsylvania Flat Tread Tire.

Pennsylvania Rubber Co., Jeannette, Pa., have placed on the market a new tire of the flat tread type, a type which is extensively used and which has met with great favor. Because of the shape of its tread, this tire presents a uniform wearing surface to the road, which feature add to its durability. The thickness largely lessens the chance of puncture. The tread is corrugated for the purpose of preventing skidding, but even when these corrugations are worn smooth, the tire grips firmly because of the breadth of the tread. An advantage is also gained by the flat tread from the fact that the weight is distributed uniformly over about three inches of tread width. It has also been found that the flat tread tire wears down smoothly instead of chipping off in parts and getting ragged. While it would seem that the wide flat tread would reduce the car speed, in practice it has been found that this is not so, tires of this kind being used on a large number of racing cars abroad.

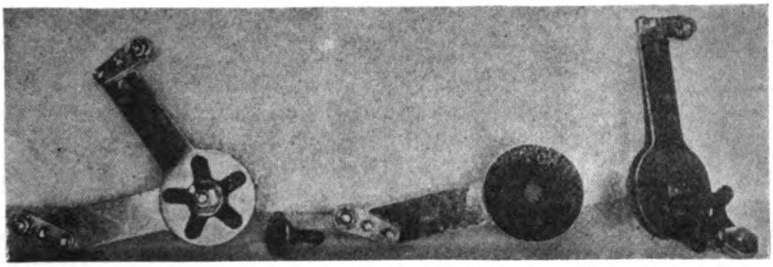
PENNSYLVANIA CLINCHER RACING TYPE
PENNSYLVANIA RUBBER CO. JEANNETTE

Pennsylvania Flat Tread Tire.

Besides this racing type flat tread tire, the Pennsylvania Rubber Co. will continue to manufacture their regular wrapped tread Pennsylvania clinchers. The large demand r Pennsylvania tires necessitated the erec- on of an extensive addition to their plant uring the past summer, and they are now shape to fill a much larger demand.

The 1906 Hartford Suspension.

That America is now devising things in utomobiling for the foreigners to make use ' is proven by the recent mission abroad of . V. Hartford, president of the Hartford uspension Company, 67 Vestry Street, N. . Although originally the Hartford sus- ension came from the other side, Mr. Hart- rd has made so many improvements that is now going over to sell the foreign mak- s the license to make use of the device as will be marketed in 1906.


The 1906 Hartford Suspension.

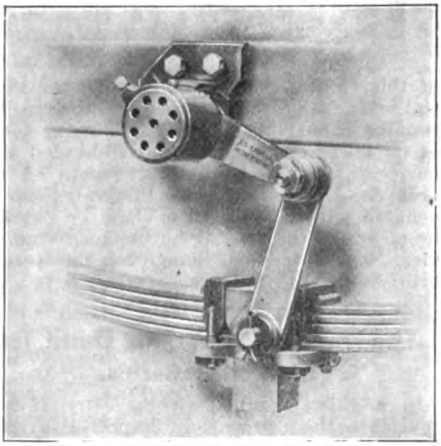
The new Hartford suspension is now fitted th a self-adjusting device, which requires tightening up as in the past. There is a e-prong spring washer that takes up all the side wear, and the wheel is held in place a split nut of Mr. Hartford's own design. this new device, known as Model H, the ms are more easily secured to the frame. is made of spring steel throughout, except e friction discs, which are made of leather. l the parts are held together by a central ud, upon which is a hardened and ground eel bushing, that the arms rotate upon. his model H suspension remains at an equal nsion for an indefinite period after its in- al adjustment at the factory. A straight and down movement is produced by e center arm moving between the o outer arms, which are joined firm- and form a rigid construction. e sample which A. G. Hoffman, treasurer the company, is now showing to the trade, s one double and one single arm, instead of o single arms. This makes it impossible r the arms to shear off. Being self-adjust- g, the device needs no attention after being aced on the car.

Diezman Shock Absorber.

The Diezeman Shock Absorber Co., 1311 udson St., Hoboken, N. J. are manufactur- g the Diezeman Shock Absorber, a practical evice which it is claimed effectually over- mes all excessive spring rebound from run- ng over rough roads. It requires no other djusting after once being attached to either e inside or outside of the chassis frame and has been used on a test run of 5,000 miles without requiring adjustment.

It comprises a bronze casing A, which contains steel heads or plates and fibre friction discs. A friction spindle is bolted directly to the side member of the chassis. The friction discs are packed in grease and are adapted for adjustment to yield the desired resistance by means of a screw plug B. By this means the amount of friction necessary to effect the desired retardation or resistance may be obtained. This adjusting plug B, is held in position by copper seated locking device C. A lever D, is connected at one end to the friction spindle, working in the casing A, and at its either end to one end of a connecting link which is pivotally secured to a plate F, mounted upon the vehicle axle or spring. The joint E, consists of a tapered stud working in a fibre bushing, for the taking up of any possible wear.

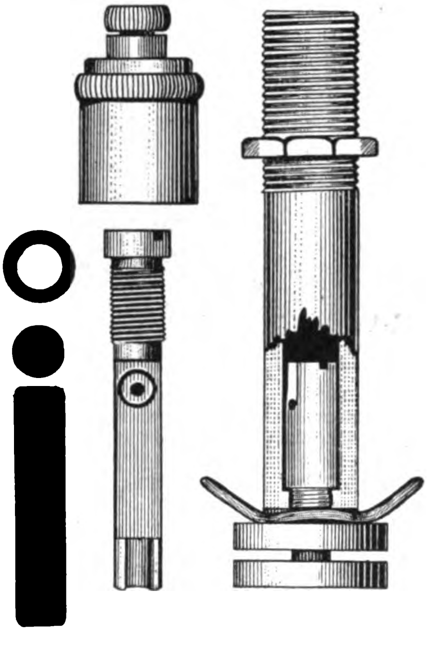
The friction surfaces are packed in grease, of which a reserve supply is maintained between the steel heads or plates, and the apparatus being absolutely dirt and air tight, renders the appliance proof against the introduction of all foreign substances. As nothing can get in or out, the grease cannot waste.


The Diezeman Shock Absorber Attached.

Douglas Andrews, the selling agent for the Berkshire Automobile Company, of Pittsfield, Mass., selected a location in the centre of the automobile business for his Chicago branch while on his Western trip. Other branches will also be established at Brooklyn, N. Y., Boston and Pittsfield, Mass. Chas. Van Sicklen will look after the Chicago agency.

The Buck Tire Valve.

L. K. Buck Tire Valve Co., 136 W. Main street, Freehold, N. J., has designed a new automobile tire valve which he is offering the trade at $1 and $1.50 list, respectively, for two sizes. The cut herewith illustrates plainly the component parts of this valve and the general construction of the ensemble. In this valve a flat or leaf spring is used which will not sag or weaken. A particular feature of this valve is the groove around the inner end of the air orifice. Other features are the counter bored valve tube, the integral flange at its lower end and the button-headed stud device. A small rubber disk seats on the groove. A tire fitted with this valve can be deflated with a coin, knife-blade or flat key by means of the tubular button-head stud device. The valve shell flange remains permanently on top of the tire.



The Buck Tire Valve.

The "Geecee" Charging Outfit for Ignition Batteries.

In addition to the "Geecee" dry storage ignition battery previously described in these columns, The Royal Battery Co., 143 Chambers street, New York, are now putting out an outfit for charging ignition batteries. This outfit is also called the "Geecee" and is designed to be used in connection with the Geecee battery. It can be used in any position and can be hung on the wall or ceiling or attached to a bench or table.

As many find it difficult or impossible to determine which is the negative and which the positive pole of a direct current, the manufacturers of this outfit provide what they call the "Polefinder," consisting of a strip of yellow paper which, when soaked in water, will print the negative pole in red when the wires of any current are pressed upo The Geecee charging outfit is made at ent for 110 or 220 volt direct current cir

The Foster Shock Absorber.

The Gabriel Horn Mfg. Co., 422 Sup street, Cleveland, Ohio, have recently p on the market a new shock absorber, co ing of a small, light cylinder, made of drawn steel, with piston or plunger v is attached to the frame. The lower po of the cylinder contains oil. The sudden pression of the spring forces the plunger against the oil, and the plunger head constructed that when it comes in co with the oil in the lower part of the cyli it forces the oil through two small v into the upper chamber, then when the occurs, the oil acts as a cushion and plunger returns with a slow, steady which prevents the jar and shock alway casioned by a sudden bump. The oil back into the bottom chamber a small tion at a time and thus relieves the s and jar from the spring. The Foster sorber is economical, simple, compact substantial. It weighs 2½ lbs., is adjus in every direction and can be placed on machine. An illustration of this device pears in the advertisement of Gabriel Mfg. on page 457, this issue.

Standard Roller Bearing Co., of Phil phia, has recently commenced the ere of a brass and iron foundry 60x125 fe stories in height. Their crucible steel ca plant, recently put into operation, is 95x6

The Locomobile Co. of Bridgeport, C have gotten out a series of souvenir po illustrated with pictures of the Locomobil at various stages of the Vanderbilt Cup There are 12 cards in the set and the mobile Company is selling them at 12 per set. The demand for them has very great.

At the annual meeting of the stockho of The Midgley Mfg. Co., Columbus, held December 4th, at their new factor Dublin avenue, the secretary's report sh a very successful and profitable season's ness. The following officers were electe serve during the ensuing year: Th Midgley, president; E. A. Cole, vice-p dent; C. S. N. Krumm, secretary, and F Flowers, treasurer and general manager

B. A. Gramm, of the Logan Constru Co., and other practical scientific me Chillicothe, Ohio, have formed a com under the name of The Mechanical Adv Board, the aim of which is to advise ventors, for a small fee, as to the prac bility of inventions. Mr. Gramm is so quently asked for advice of this sort and is such a need for a company of this that he gathered other practical men him and formed the Mechanical Adv Board, which will doubtless be the mea saving inventors thousands of dollars w might otherwise be spent in useless pa and experimenting.

The Reading Standard Bicycle

is the favorite mount on account of speed,
lightness and great strength.

THE READING STANDARD has been the winner in nearly every race entered, and holds the record for 50 miles in one hour.

In the great Six Day Cycle Race, just held at Madison Square Garden, New York, all the foreign and a large majority of American riders, rode Reading Standard bicycles.

First prize was won by Root and Fogler on Reading Standards.
Second prize was won by Bedell Bros. on Reading Standards.
Third prize was won by McLean and Moran on Reading Standards.
Fourth prize was won by Vanderstuyft and Stol on Reading Standards.

It is the bicycle for every-day use, for business and pleasure, and assures perfect satisfaction.

We offer the following models:

Reading Standard "Pace-Follower" .	(Men's Model only)	List, $60.00
Reading Standard "Racer"	(Men's Model only)	List, $50.00
Reading Standard "Road Racer" . .	(Men's Model only)	List, $40.00
Royal Reading Roadster	(Men's Model)	List, $30.00
Royal Reading Roadster	(Women's Model)	List, $30.00

We call special attention to the lightness and the fine artistic and lasting finish of these models.

It will pay you as a bicycle dealer to arrange at once for the **READING STANDARD** Agency. As a selling proposition, this line of bicycles is without an equal.

Write for detailed description of different models, and our agency terms. We will make it worth while for good dealers to handle our line.

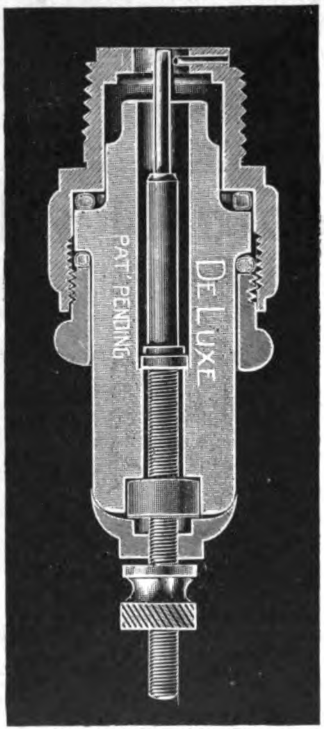
Reading Standard Cycle Mfg. Co.

READING, PA.

Leavitt & Bill, San Francisco, Cal., Distributors for State of California.
Scott Supply & Tool Co., Denver, Colo., Distributors for the Rocky Mt. States.

De Luxe 1906 Ignition Plug.

De Luxe Mfg. Co., Buffalo, N. Y., have their 1906 plug ready for the market, sectional view of which is given herewith, which with porcelain cap, which won great favor claims made for this plug by the manufaclated, porcelain plug of accepted design, embodying no freak or radical ideas. Special turers are that it will not soot, short circuit or carbonize. The porcelain used in this plug is made from the very finest grade of imported clay, with all metallic and foreign substances taken from it. The grain is very dense and the clay baked at a temperature of 2700 degrees F. It will stand a high tension current resistance of from 100,000 to 150,000 volts before puncturing. Copper asbestos gaskets are used in packing the porcelain core into the shell, which will not stick into the threads, in dissembling plug, when cleaning.



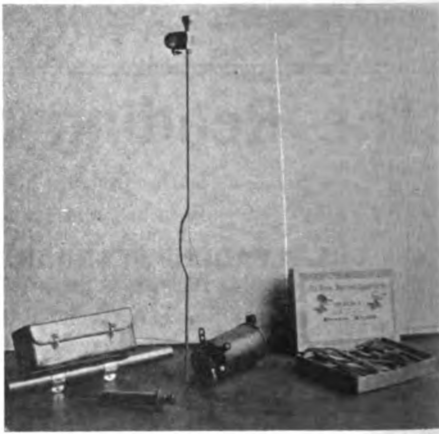
De Luxe 1906 Ignition Plug.

The air gap extends still further into core than in their 1905 plugs, being 1½ in. deep, and acts as a chamber for the compressed gases. The lower end of the steel shell is partly closed, causing a suction effect by which the spark points are cleaned and carbonization between electrodes prevented. The electrodes of the De Luxe ignition plugs are composed of platinum and composition of other metal, which make them durable and with little liability to corrode. The composition is made under their own secret formula, and will not disintegrate under a high heat, standing a fusing point of 2600 degrees, which allows a continuous and uninterrupted spark.

The packing nut is made of brass, the lower shell of steel, nickel plated, turned of hexagon steel, having large faces on nuts that will hold a wrench securely. The regular ½ in. pipe size has a taper thread and shoulder above same, on which a copper asbestos gasket can be used if found necessary. The price of the porcelain plug is $1.50. They will also continue making their mica plug in 1905 for air-cooled engines.

Corson Motor Cycle Specialties.

The Indian Motor Cycle Co., 258 Columbus avenue, Boston, are preparing a catalogue of motor cycle sundries which will be ready by January 15 and includes a number of desirable and salable articles.



Corson Muffler Cut-Out, Tool Bag, Oil Gun, etc.

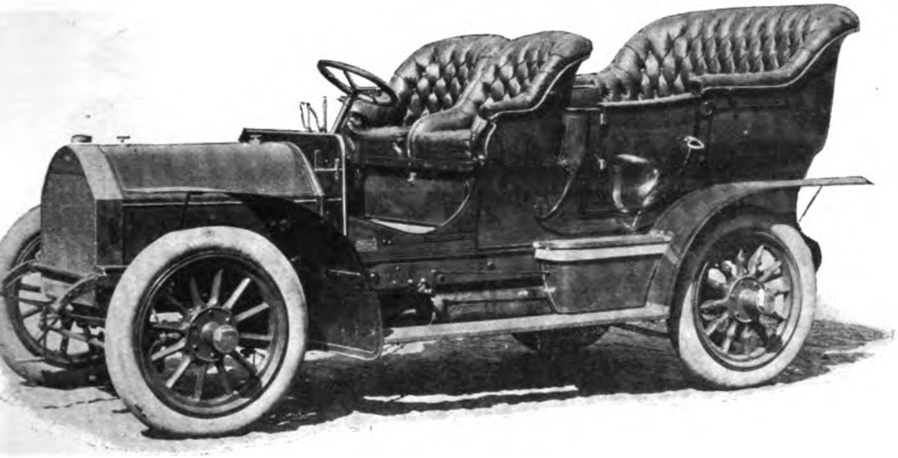
The "Cut-Out" here shown is new and can be readily applied to the Indian or any machine using the "Hedstrom" motor and muffler in the same position. Used open, the increase of power is quite noticeable and it can be closed with a touch to run the engine quietly while passing a team or in thickly settled sections.

It is quite a help for those who desire the maximum of power and speed and for use with "tri" or "side" car attachments. It sells for $2.50.

The tool bag is 3x3x8 inches inside measurements. It is large enough to hold besides the usual small tools—an extra inner tube and an oil gun. It is furnished with the holder for attaching to the frame, as shown in the cut. Price of best grade is $2.50 each. No. 2, $2.00 each.

They also furnish an oil gun at 80 cents and handle the Corson luggage carrier listing at $1.25, and Corson cycle stand, listing at $5.00.

Under the auspices of the Iron Clad Library Association a grand entertainment was given to celebrate the opening of the new steel barrel factory of the Iron Clad Mfg. Co., Brooklyn, N. Y., where it was held. The Iron Clad Mfg. Co. make steel storage barrels and steel tanks for gasoline.



The Chadwick

America's Most Magnificent and Best Built Car

Engine, 40-45 H. P.; 4 cylinder vertical. Sliding gear transmission made of chrome nickel steel, has four speeds forward and one reverse; double chain drive; wheel base 109"; tires (make—optional) 34x4½".

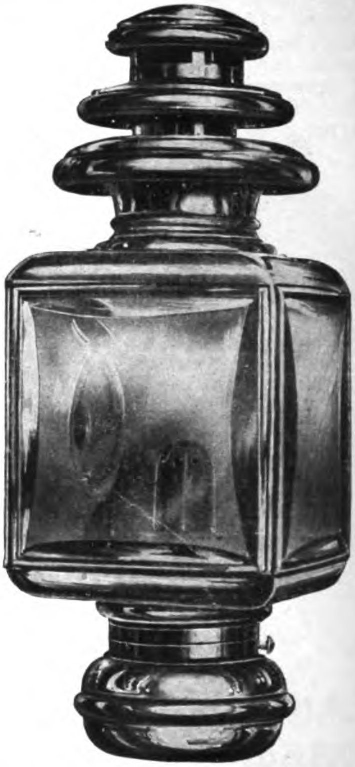
Touring Car, $5000; with Limousine Body, $6000. Finest mechanical equipment throughout. *Guaranteed for one year from date of sale.*

Chadwick
Motor Car Co.

SOLE SALES AGENTS

3205 Spring Garden St.
PHILADELPHIA, PA.

We will at an early date open a salesroom in New York and we will announce the address in the next issue of this publication.



"This elegant square Limousine lamp is one of the latest products of

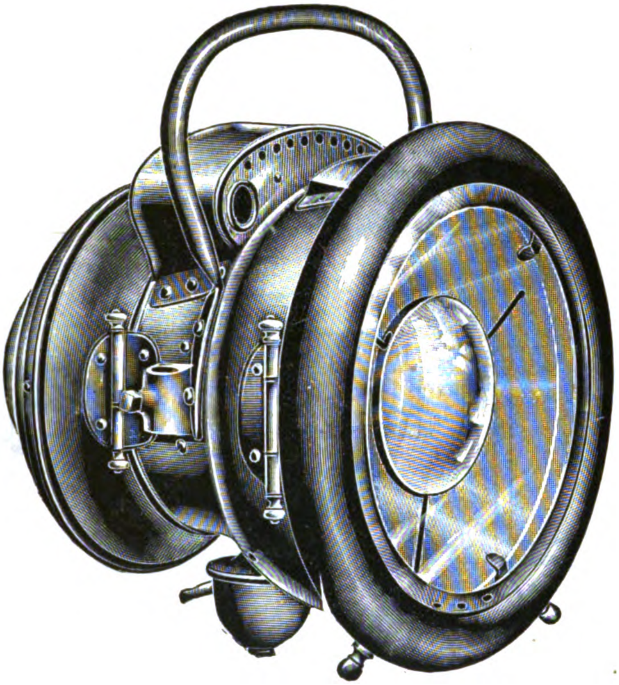
THE STANDARD LINE

Produced by the Standard Carriage Lamp Company, of Chicago

Their claims for this lamp are that it is to the Limousine and fine Automobile what the silk hat is to the dress suit, eliminating the jockey cap extended appearance so commonly used and unbecoming, all because the lamp makers of this Company have not offered something more appropriate. There has been no expense, time or pains spared to bring this article to the highest degree of art in lamp making. We will therefore leave the public to judge for themselves regarding its outlines. They also claim that capable judges have passed upon this lamp as being far superior to the French product. It has a large red jewel in the door or the rear, showing the regulation sign of danger. The oil font is removed by pressing in a little knob, as shown in the illustration, similar to that of the opening of a hunting case watch; thence turn to one side a little, and the bottom comes right off, which is held securely in a groove and one slot, making it 'lose off' proof. The prop fastenings are for either round or flat irons, and also possesses other convenient features which makes it all that could be asked for. This lamp also can be equipped for electricity. The Company would be pleased to furnish further particulars and illustrations to all interested."

STANDARD CARRIAGE LAMP COMPANY

43 and 49 South Canal Street CHICAGO, ILLINOIS



1906 MODEL

AUTOLYTE

Don't let the price scare you for if we are willing to sell this type of lamp at a reasonable price that's our secret. It is absolutely high grade in every respect. If not all we claim for it, money will be refunded. Write for our claims and other particulars.

100.	Diameter of	front,	9	inches;	Depth	9	inches.	Price,	$12.50
101.	"	"	10	"	"	10	"	"	15.00
102.	"	"	11	"	"	11	"	"	20.00

Note: These are New Style **Open Back and Front**
Write for discount and advance sheet of lamps and imported horns.

A. H. FUNKE

83 Chambers Street, NEW YORK

The Ever-Ready Starter.

We are now able to present to our readers a detailed description of the Ever-Ready starter, a mechanical device designed for the purpose of automatically starting any gasoline engine by the operation of a small release lever which was briefly described in a recent issue. It is connected by wire cable or chain to a foot lever on the floor of the car, and after starting the motor it is automatically rewound by the motor itself as soon as the same has acquired a sufficient or predetermined speed, and when fully wound up is automatically disengaged from it. This rewinding and releasing is accomplished in a few seconds and is entirely automatic.

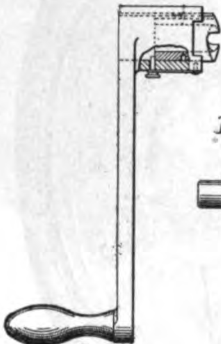


Fig 1

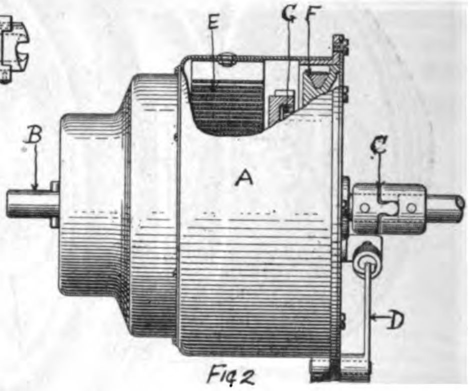


Fig 2

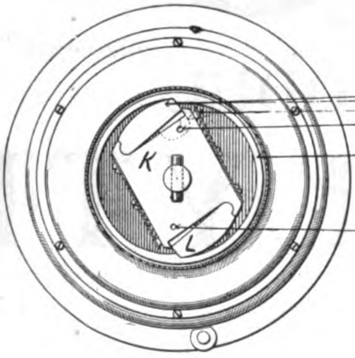


FIG 3

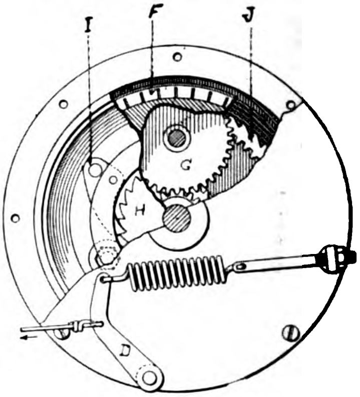


FIG 4

CONSTRUCTION OF THE EVER-READY STARTER.

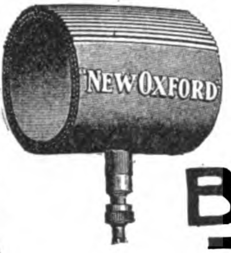
A—Outside shell or casing.
B—Extension of engine shaft.
C—Coupling to allow for flexibility.
D—Is a starting clutch lever connected with pedal release lever by wire cable or otherwise on the floor of the automobile.
E—Section of starter spring.
F—Brake or starting clutch disc head and band.
G—Cycloidical reducing gearing.
H—Starting ratchet secured to starting shaft.
I—Starting pawl secured to brake or clutch head.
J—Internal gear and ratchet combined through which the spring is rewound and locked by means of pawls to the disc or clutch head.
K—Centrifugal or rewinding clutch.
L—Centrifugal rewinding dogs engaging with external member of centrifugal clutch M.
N—Front face view of starter.
O—Holes for releasing pins.
M—External member of centrifugal clutch.
P—Centrifugal clutch spring.

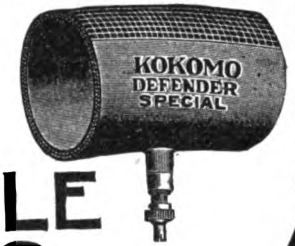
After the starter is wound up and automatically disengaged, it may stand for any length of time, yet is ready at any moment to be thrown into operation for the purpose of starting the engine. For the initial operation of winding up the spring, or in case of its becoming run down because of **spark failur** the ordinary starting crank is used and t starter is provided with a "Sun and Plane system of gears, with a reduction in torqu of 10 to 1, so that the task is an easy one.

The head of the starting crank (Fig. 1) provided with a telescoping engaging clut which is held either in an advanced or r treated position by a positioning pin. Whe advanced it engages the pin in the engi shaft in the usual manner. When retreat the crank engages the set of gears befo mentioned and the spring is wound up wi one-tenth the effort required for ordina cranking and with entire immunity from da ger.

The spring being wound up, the motor started by pressing the foot pedal, whic through its connections with the clutch lev (D), serves to release the tension of the clut band of the clutch (F), which permits of t unlocking and the rotation of the disc he member of the clutch (F).

THE KOKOMO





BICYCLE TIRES ARE A PAIR OF ACES

If you want to handle "sure winners"

for 1906, you will buy the **"New Oxford"** and **"Kokomo Defender Special" Bicycle Tires.** Year after year of making durable and serviceable tires has resulted in the **KOKOMO** Line's becoming universally recognized as being the best the market affords. Do not experiment with some untried tire, which is likely to be unsatisfactory. Write for further particulars.

KOKOMO RUBBER CO., KOKOMO
INDIANA

The inner end of the tightly wound spring is connected by the locking pawls and ratchet (J) and automatically with the starting ratchet (H), which is secured to the engine shaft, and as its power is released it rotates the shaft and starts the motor.

When the motor crank shaft has acquired a predetermined speed, controlled largely by the weight of the dogs (L) and the adjustment of the springs (P) the dogs (L) are thrown out The Vienna show will begin March 18 and by centrifugal force and engage the clutch member (M), which is connected with the 10 to 1 gear system; the internal member of which connects through a spring arbor with the spring, and as the shaft revolves it rotates the arbor through a reverse direction to the running direction of the engine and rewinds the spring.

When allowed to retract it will do so in the direction corresponding to that of the engine for the purpose of starting it. When the spring is fully wound, a set of cam shaped pins are forced outward and into the holes (O) which draws the winding dogs (L) out of engagement with the clutch member (M) and the operation is complete and the starter ready for a repetition of the whole operation.

The operation of these pins is affected by a screw actuated release which disengages the rewinding operation when the spring has been rewound a certain definite number of turns and permits of the clutch being thrown into operation to rewind as soon as only one turn of the spring has been used.

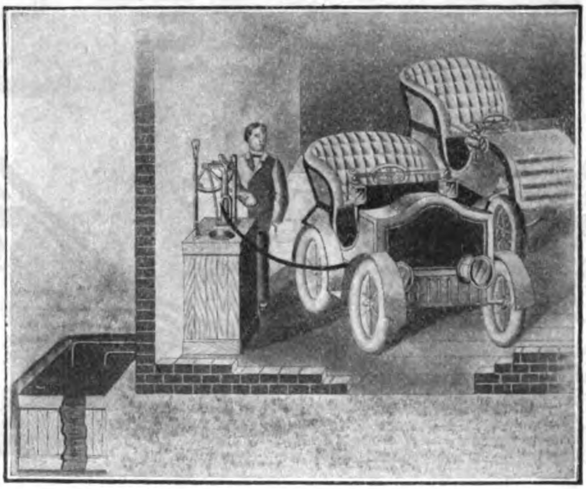
The device as a whole is a simple one and operates with absolute certainty. In appearance it is not objectionable. Its need is so apparent in this trade and its great value and convenience so self evident that it is sure of a large sale. True, the modern 4-cylinder car will start on the spark under favorable conditions, but these conditions are never sure, and an experience with a great number of owners has shown that after having a car motor that is self starting nine-tenths of the time they are much more annoyed by the necessity of cranking it occasionally than they previously were in cranking it every time.

It is made in two sizes, weighs about 35 lbs., and will sell for about $60.00. Quite a number will be applied to demonstration cars at the New York show, where they can be seen and tried. Also they will be exhibited at the space of the manufacturers, the American Electric Novelty and Manufacturing Co., on the concert hall stage, Madison Square Garden.

"Western" Fuel Storage Outfit.

Western Oil Pump and Tank Co., 2437 Kosciusko street, St. Louis, Mo., are marketing a fuel storage outfit of interest to garages and fuel depots of all kinds. The outfit comprises the usual underground tank, inside cabinet and pump and complies with the most rigid requirements of the insurance companies.

The tank can be located any distance from the building where the pump is situated, and placed underground as many feet as desired, and the pump is guaranteed to lift any desired number of gallons and force them through the goose neck into the can or receptacle into which it is to be turned.



The "Western" Underground Fuel Storage Outfit.

The tank is built of heavy galvanized sheet steel, encased in wood. It is constructed with a sheet lead bottom, which extends three inches up on all the sides and which is not liable to be effected by the acids contained in gasoline, benzine or naphtha.

The cabinet is built out of yellow pine and finished with one coat of filler and two coats of varnish.

The regular size will measure one quart or one-half gallon at a stroke; upon special order they will make a pump that will measure a gallon at a stroke. This outfit is airtight and non-evaporative, because it is equipped with valves wherever evaporation might be possible.

For filling automobiles, the pump is supplied with a hose connection to be attached to the nozzle of the goose neck, and by means of a half inch rubber hose attached to this connection the exact number of gallons desired can be measured into the machine without using measures.

The WITHERBEE Storage Battery Igniter

"EVERY BATTERY GUARANTEED"

WITHERBEE
STORAGE BATTERY IGNITER.
PATENTED.

"EVERY CUSTOMER SATISFIED"

Recognized as the most satisfactory means of ignition

Suitable for any Gas or Gasoline Engine using the make and break or jump spark ignition.

Our batteries are now used and endorsed by forty-five of the leading automobile and motor boat manufacturers.

OVER 10,000 NOW IN USE

Every Battery guaranteed to give satisfaction or purchase money refunded.

Can you afford to consider anything else for your '06 car?

Write for Descriptive Pamphlet Electros Furnished Jobbers.

Witherbee Igniter Company

541 WEST 43d STREET, NEW YORK CITY

The Holley Magneto Ignition System.

Holley Bros. Co., 668 Beaubien street, Detroit, Mich., have brought out a new magneto constructed on the Huff system. As far as mechanical parts are concerned it is very similar to other devices, but the system is absolutely different from anything produced in Europe or this country. Its chief peculiarity lies in the fact, that a condenser is utilized to produce a very sudden flow of current in the primary winding of an induction coil. The advantages claimed for this system are:

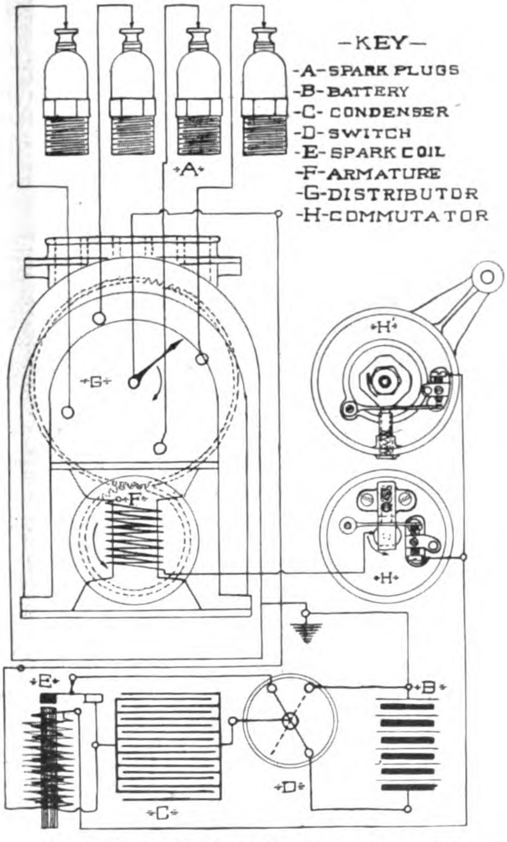


Fig. 1. Electrical connections for Holley magneto; A, spark plugs; B, battery; C, condenser; D, switch; E, spark coil; F, armature; G, distributor; H, commutator.

First, a single coil with vibrator can be used in connection with both magneto and batteries. When the batteries are thrown in, the trembler operates, giving a good spark to start on, when a single spark would not start. As soon as the magneto is thrown in, the trembler stops vibrating, as the discharge through the condenser is too rapid to allow its operating. This then produces absolute timing, which produces a smoother and faster running motor.

Second, on account of the heavy discharge from the secondary coil, oil on the spark plug does not affect them, as it simply burns up.

Third, the secondary coil not being on the armature, there is absolutely no chance of breaking down.

Fourth, this machine will produce a 3 in. spark at six hundred and a ⅜ in. spark at 50 R. P. M.

Fifth, there is no chance of connecting the magneto up with the batteries wrong. This system tends to build up the magnets and they are guaranteed to be stronger in six months

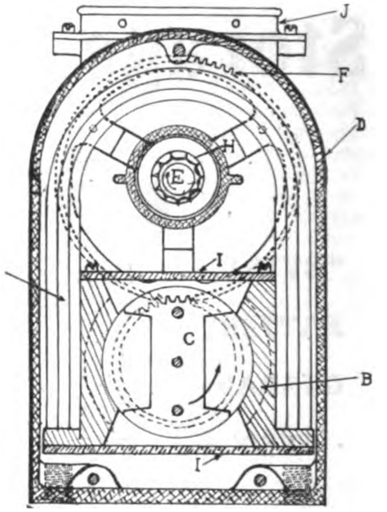


Fig. 3. End view Holley magneto, showing setting of primary commutators: A, magnets; B, pole pieces; C, armature; D, case; E, time shaft; F, time gear; H, ball bearings; I, cover for pole pieces; J, wire clamp for secondary wires.

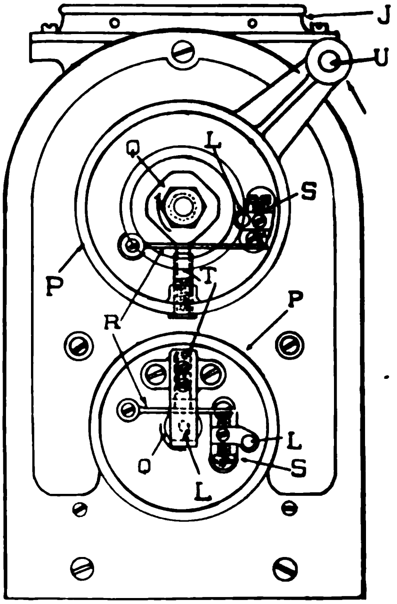
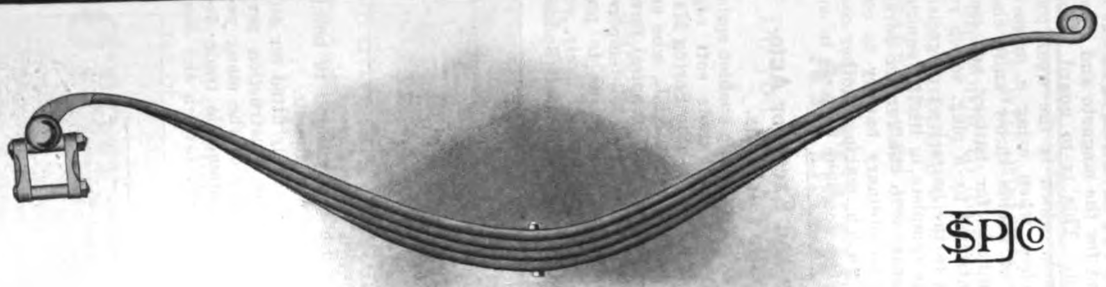


Fig. 4. Holley Magneto: J, wire clamp for secondary wire; L, carbon brushes; P, upper primary commutator; P', lower primary commutator; Q, cam; R, lever with platinum point; S, adjusting screw with platinum point; T, spring plunger; U, advancing lever.

than when new. The B. H. P. of the moto is increased by the magneto about 5 per cent



SPRINGS

Manufacturers You are spending a lot of money for aluminum parts to take a few pounds of weight off your cars. Do you realize that you can save many more pounds by using our springs! Why? you ask. Because—The springs are made in a plant devoted to manufacturing **Automobile Springs,** newly equipped. Each and every shipment of steel received from the mills is especially tested. If not up to specified analysis, it is rejected. By the use of this special steel, combined with our system of tempering, together with correct designing and in the hands of the most skilled and experienced workmen, we are enabled to turn out springs that are much lighter and give greater efficiency than any others.

If you have spring troubles or desire expert advice, come to us

DETROIT STEEL PRODUCTS CO. :: Detroit

Several of these magnetoes have been in use varying from six to eight months, giving excellent satisfaction, and it is said are stronger to-day than ever.

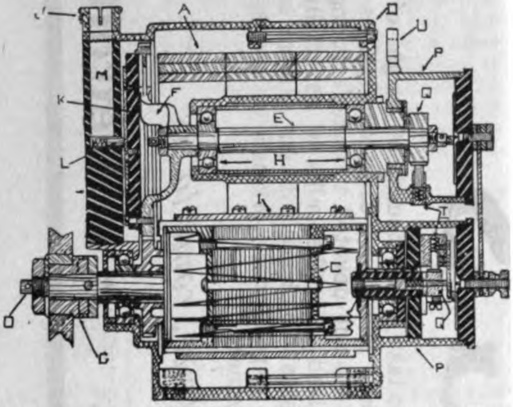


Fig. 2. Longitudinal cross section of Holley Magneto:

A—Magnets.
B—Pole pieces.
C—Armature.
D—Case.
E—Time shaft.
F—Time gear.
G—Clutch for driving shaft.
H—Ball bearings.
I—Cover for pole pieces.
J—Wire clamp for secondary wires.
K—Brass distributing plate.
L—Carbon brushes.
M—Holes for secondary wires.
N—Secondary distributor.
O—Driving shaft.
P—Upper primary commutator.
P—Lower primary commutator.
Q—Cam.
R—Lever with platinum point.
S—Adjusting screw with platinum point.
T—Spring plunger.
U—Advancing lever.

The electrical connections of the entire system are shown in Fig. 2. The current is generated in the winding on the armature F, which rotates between strong permanent magnets. This current is then commutated at H and leads to a condenser C, which it changes. There is a timing gear, which turns a cam in commutator H, that allows the circuit to close at just the right time. When this is done, the condenser C discharges into the primary winding of an induction coil E, which sets up a very high voltage in the secondary winding of said coil, which is capable of jumping an air gap. This current is carried to the secondary distributor G, which is also operated by the time gear. The current is then distributed to the four terminals which lead to the spark plugs through highly insulated wire. The plug switch D is one especially designed for the magneto and is very highly insulated. This is to guard against receiving a shock, which is the weak point on many switches, when using a magneto. The switch is of double throw knife blade type, with terminals for battery and magneto. It is controlled by a plug, which you insert and turn to the battery of magnets.

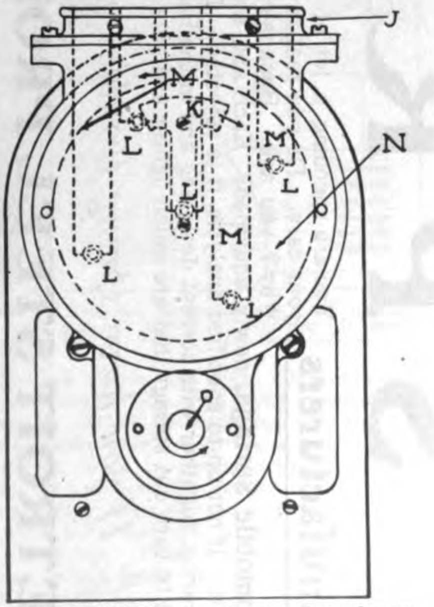
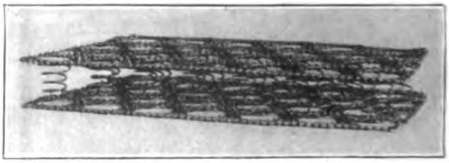


Fig. 5. Holley Magneto: J, wire clamp for secondary wires; K, brass distributor plate; L, carbon brushes; M, holes for secondary wires; N, secondary distributor; O, driving shaft.

This system is complete in itself, requiring no other apparatus, with the further advantage of having an ordinary battery to connect in through switch, making another complete system or two complete systems in one.

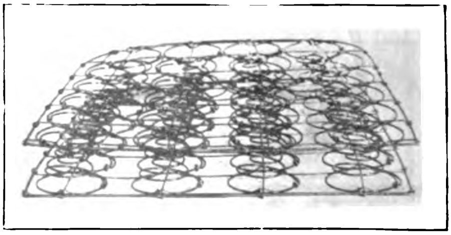
Perfection and Excelsior Automobile Cushions.

The "Perfection" automobile cushion spring is intended only for high grade soft edge cushions. It is made by Trenton Spring Mattress Cushion Co., of Trenton, N. J., who use only the best stock, tempered, in spiral form, and all edges are rodded with oil-tempered rods. The construction is such as to produce a cushion very resilient and lively, yet having a large carrying capacity. Sudden shocks will not cause this cushion to bump and throw the occupant into the air.



The "Perfection" Cushion Spring.

The "Perfection" is especially fitted for automobile work in that the construction permits its being made in any of the many peculiar shapes that the automobile trade demands. They can therefore furnish any size or shape cushion, and what is of considerable importance, any height of cushion, although they recommend a cushion from 3½ in. to 4 in. high.



The "Excelsior" Cushion Spring.

To meet the demand for a medium priced soft edge cushion they are showing the trade

A WORD TO THE WISE

REGARDING 1906 EQUIPMENT

This will undoubtedly be a banner year for motor cars. e are going to make it our banner year. We want your busi- ess for supplies of all kinds—no matter how small the order, e want it—and we shall take care of it right.

ATTENTION—WISE DEALER!

Do you buy cars in Detroit? Get next—Save freight.

TOPS

Just write for Prices, Specifications, and Samples of Mate- als. You'll be convinced. We build tops that you cannot atch anywhere for quality, fit, style and workmanship. Let quote you our prices and we'll get your order for season's quirements.

We are ready now for 1906 cars with a complete line of r popular specialties. **Chain Boots** (patented) invaluable for ain drive cars. **Engine Cases** or **Mud Aprons** without which car should leave the factory.

ALSO

e most carefully chosen stock in America of everything in e line of

OTOR CAR ACCESSORIES

AND

LIBERAL DISCOUNTS.

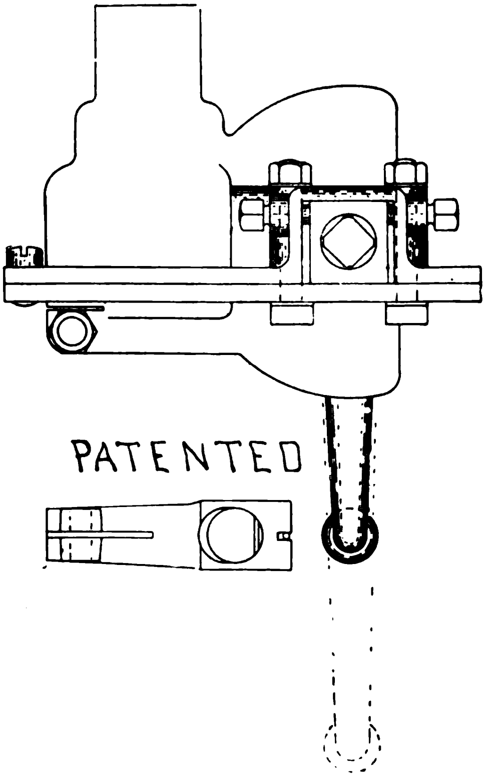
THE AUTOMOBILE EQUIPMENT CO.,

260 JEFFERSON AVE., DETROIT, MICH.

their 'Excelsior," which is very substantially made and can be furnished in any desired shape or height. The Excelsior is a first-class cushion for such trade as must take cost into consideration, and will be found to give satisfaction the makers claim. They are desirous of getting their cushion before the trade and would be pleased to receive drawings or patterns, so that they may furnish samples of their line free of charge.

Warner Steering Gear.

Warner Gear Co., of Muncie, Ind., have a new steering device on the market of the worm and segment type. Worm, segment and cones are all made of open hearth steel, case hardened and ground to gauge. An important feature of the Warner device is that all the teeth in the worm engage the segment at one time, which increases the shearing strength of the segment. The worm cannot cut a notch in the segment, nor can the segment wear a notched worm.



Warner Steering Gear.

Another valuable feature of this device is the universal adjustment. The worm is adjustable up and down and the segment is adjustable to the centre of the concave worm. Spark and throttle control can be operated through the steering column and does not interfere with any other working part. This feature makes it possible to use the Warner device on any kind of car.

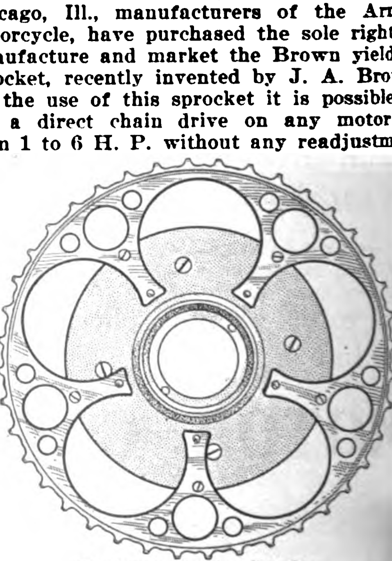
The slide which carries the segment is long enough to support the segment on both sides and at a point close to the bottom of the segment teeth, which feature prevents any s motion or looseness of the gear.

The device is mud and water-proof and a oil tight. The segment slide is adjusted means of two adjusting screws on each of the segment axle, which makes a str lock and absolutely prevents any moveme shifting or springing out of working line. T segment axle carries a lever which mo through an arc of 90 degrees. The lever fitted at one end to a square on the segm axle. The lever also has ball and socket the lower end. The lever can be placed either the right or left side of the device may be reversed on either side, which gi four positions from which to get a suits fit on the car. The device is made with b right and left hand worms. The casing made up with suitable angles or lugs to the car frame when required.

The 1906 Warner differential gear will supplied with an additional number of ions, and the pitch of the teeth has been duced from 10 to 8, which greatly adds the strength of the gear. The gears, pinio and bearing bolts are case hardened ground. The end supports are part of case retainers. Most of the 1906 War differential gears will be mounted on ext sions which makes the differential gear true, as there is no working joint betw the bevel ring and the bearing proper wh causes the pitch line to remain perfect.

The Brown Yielding Sprocket.

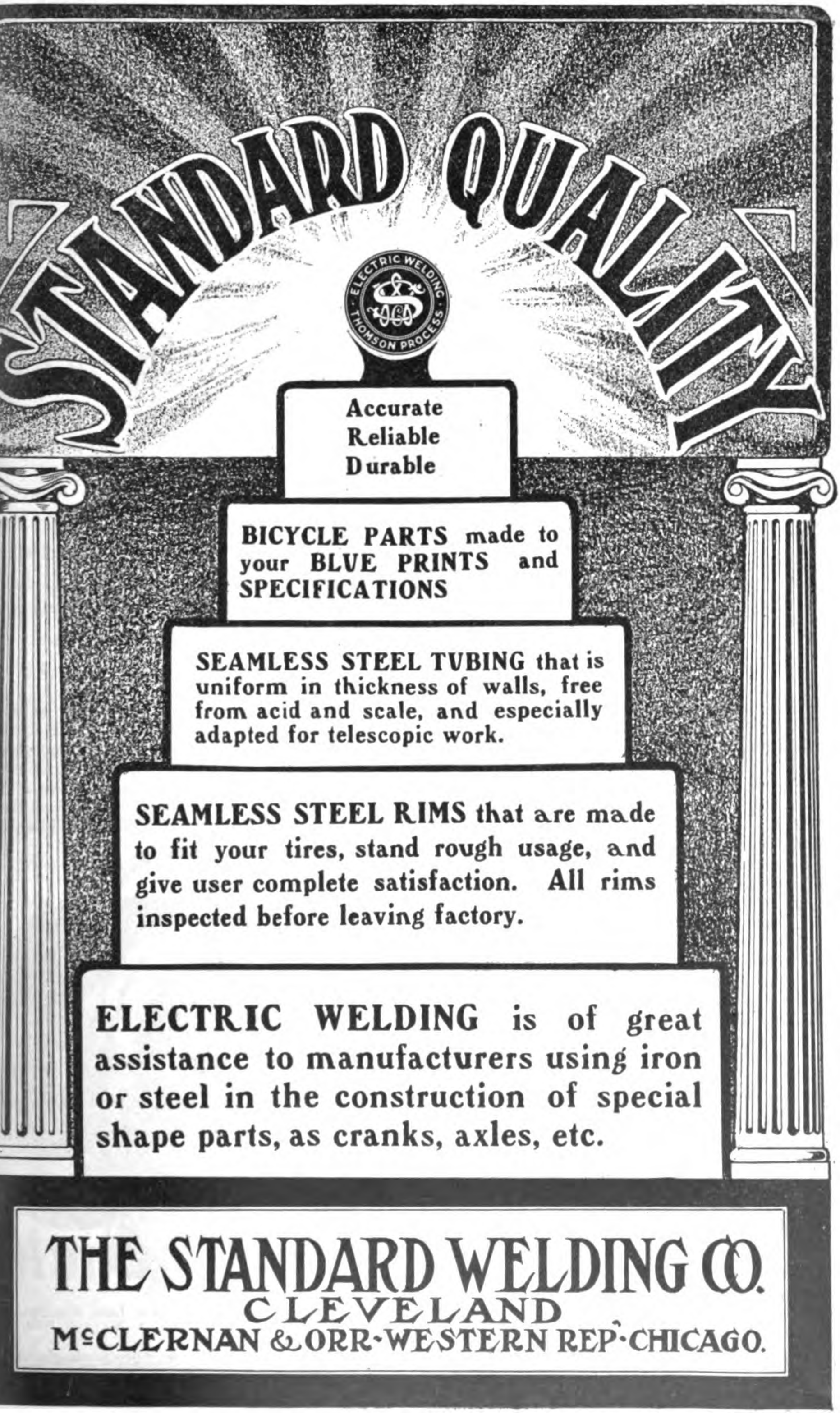
The Armac Motor Co., 472 Carroll str Chicago, Ill., manufacturers of the Ar motorcycle, have purchased the sole right manufacture and market the Brown yield sprocket, recently invented by J. A. Bro By the use of this sprocket it is possible use a direct chain drive on any motor from 1 to 6 H. P. without any readjustm



The Brown Yielding Sprocket.

whatever, as it is adjusted at the factory all time and any size motor. It elimin chain breaking. As there are but three w ing parts there is little chance for it to out of order.

The Brown Gear Wheel, as they call i made to fit either the Corbin or the T coaster brake, and is also made with var size chain sprockets.



STANDARD QUALITY

ELECTRIC WELDING THOMSON PROCESS

Accurate
Reliable
Durable

BICYCLE PARTS made to your **BLUE PRINTS** and **SPECIFICATIONS**

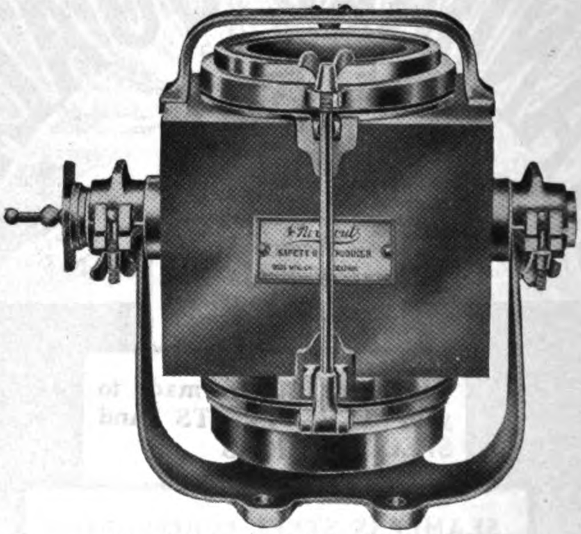
SEAMLESS STEEL TUBING that is uniform in thickness of walls, free from acid and scale, and especially adapted for telescopic work.

SEAMLESS STEEL RIMS that are made to fit your tires, stand rough usage, and give user complete satisfaction. All rims inspected before leaving factory.

ELECTRIC WELDING is of great assistance to manufacturers using iron or steel in the construction of special shape parts, as cranks, axles, etc.

THE STANDARD WELDING CO.
CLEVELAND
McCLERNAN & ORR-WESTERN REP. CHICAGO.

New "Neverout" Patent Invertible Gas Producer.



"Neverout" Patent Invertible Gas Producer.

Rose Mfg. Co., 911 Arch street, Philadelphia, have, in their new "Neverout" Invertible Gas Producer, an attractive proposition. It is about as simple in operation as can be imagined besides possessing the further advantages of being economical of carbide and of producing and shutting off gas instantly. It is entirely automatic in its action. A half revolution of the device turns on the gas and instantly starts generation of gas. When the device is revolved back to its original position; that is, inverted, the gas is immediately automatically shut off and generation of gas stopped at once. This is accomplished by means of an automatic valve, which cuts off or turns on the gas, and the fact that in inverting the device the contact between the wet carbide and the dry is immediately broken.

The "Neverout" Gas Producer is swung on an axial bracket, as shown in the cut, and can be conveniently rotated. It is constructed on an entirely different principle from that of the ordinary generator. The carbide container is a metallic cylinder with plain surfaces. When the gas is turned off, the water is automatically at the same time also turned off. Conversely, when the gas is turned on (by revolving the device) the water and carbide are again brought into contact. One action only—a half revolution of the device—is needed to start or stop generation and to turn the gas off or on, and there is no cock or valve to attend to. A very great advantage of this gas producer is the fact that there is no waiting for gas to generate. Another is the fact that it is so simple and absolutely automatic in its action that the most careless or inexperienced user cannot use it wrongly or make any mistake with it. It is put together in such a manner that one or two turns of two butterfly nuts disassembles or reassembles the whole thing, which consists of but few parts, all strongly made and durab

The Rose Mfg. Co. are also offering new lamps for 1906. One is their "Neve Condenser-Mirror Lens Headlight, an e tionally high grade, well constructed It is provided with a bull's eye condense held in front of the burner by means strong brass bracket or spider extending the flange inwardly. The feature of thi is the fact that a much more subst bracket is used than ordinarily. Back c flame is a mirror lens reflector and the bination gives a widely diffused light sh up the whole roadway, as well as a s condensed gleam extending far ahead c car. The lamp is made of solid brass, h polished, and there is not a single sol joint in it. Two sizes are offered, one inches across the front, catalogued as No

"Neverout" Condenser-Mirror Lens Headlight in two sizes—9-inch front (No. 140) and 11-inch (No. 144).

The "BANN AUTO"

Wood Wheel

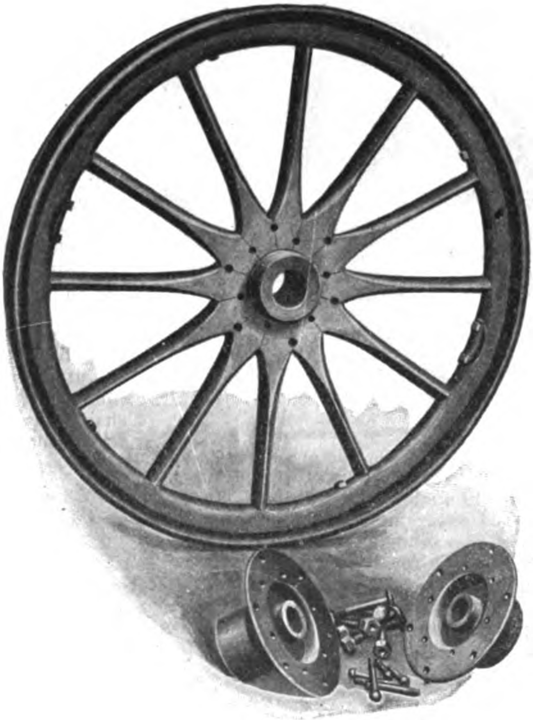
A PERFECT AUTOMOBILE WHEEL
IT WILL RUN PERFECTLY TRUE

THIS WHEEL WAS INVENTED BY

O. B. BANNISTER
President Muncie Wheel and Jobbing Co.
MUNCIE, IND.,

vho is the most experi-
nced manufacturer of
Vehicle and Automobile
vheels in this country to-
lay, and the "Bann Auto"
s made under his personal
upervision.

It can be made to fit any
xle or bearing, and it will
un true.



We are also operating an

EXPERIMENTAL MACHINE SHOP

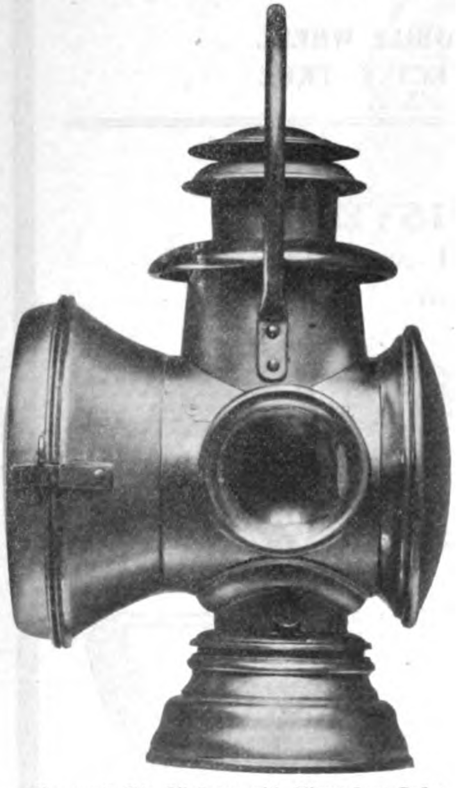
nd employ only thor-
ughly competent draughts-
men and mechanics, and
re prepared to furnish
vorking drawings and do
xperimental work for any-
ne.

Muncie Wheel and Jobbing Co.

MUNCIE, IND.

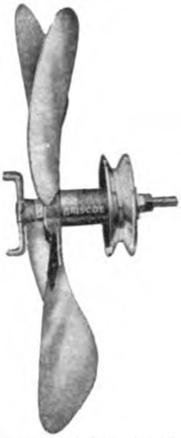
and one eleven inches across, catalogued as No. 144.

They also have an improved side oil lamp with mirror lens reflector and fitted with a double convex ground lens in the side, giving a very brilliant effect. An oil side lamp with mirror lens reflector is unique, and the Rose Manufacturing Company are finding a big sale for it. This lamp is known as No. 80. It has their patent oil fount clamped in position, the clamping sealing all openings and making oil leakage impossible. It is guaranteed to stay lit under all conditions. In fact, all "Neverout" products are guaranteed under a "money-refunded" warranty. The excellent reputation for high grade goods built up by their many years in the bicycle lamp business is well maintained in their automobile lamps and generators, it being their constant aim to produce the very best possible.


"Neverout" Side Oil Lamp with Mirror Lens Reflector and Double Convex Ground Lens in Side.

Briscoe New Fan and Deck Box

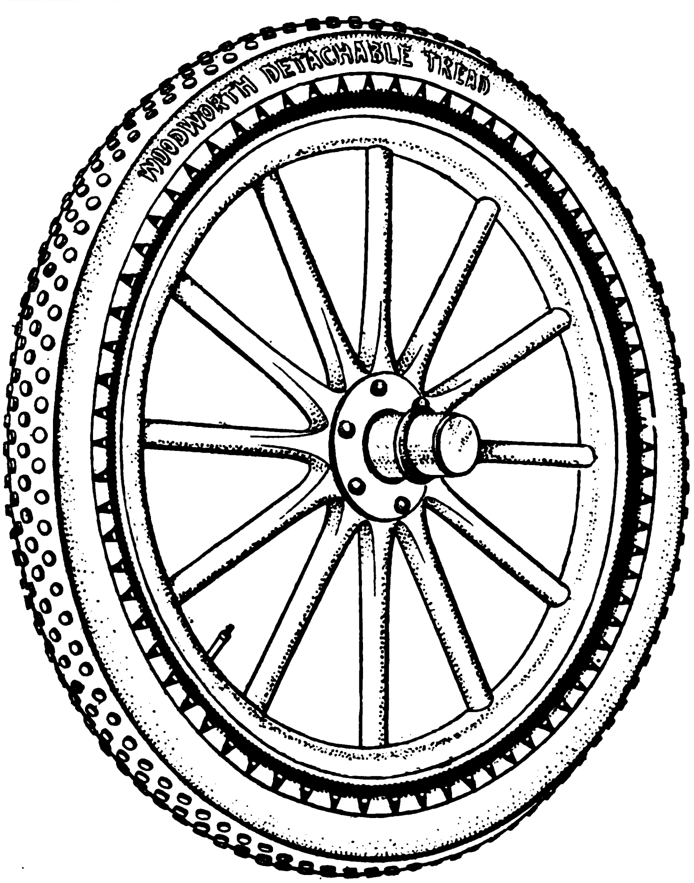
The Briscoe Mfg. Co., Detroit, Mich., offer to the 1906 trade a new disc fan called Style C. It is designed to be driven by either round or flat belt and can be used on either water or air-cooled engines, as it can be attached to the radiator of the latter. The fan is ball bearing and the distance is lengthened between the bearing cones, thereby increasing the life of the fan and reducing the friction to a minimum. The bearings require no lubrication other than that provided wher are assembled in the shop. A radical c in design consists in the shaft's being st ary. The hub now revolves with the and blades, resulting in added strengt rigidity in the fan structure as a whole ley adjustment along the shaft is obtai before over wide limits. The blades are c and highly efficient design, drawing the the most advantageous way for the app with which the fan is intended to be us avoiding the necessity of providing blade tip bands or housing. The blades rounded edges. The Briscoe 1906 stee box, differently designed, to fit variou abouts, are made both plain and beaded. are light, practically indestructible, against warping, and being designed on ing lines they add to the general appe of the machine.


The Briscoe 1906 Style C Fan.

The cover is locked down by means o ing doors which extend from side to side avoiding a tendency in the metal to p a rattle or hum. Flush locks with fla are provided in addition when desired. using metal for this construction the operation of filling woodwork is avoi

The Briscoe 1906 Sheet Steel Deck Box.

Other new products recently added t line are mud aprons and metal seats. tain better facilities for the manufact these various outputs the Briscoe Co. ha cently occupied the two-story brick bu of about 15,000 square feet, formerly by the Wheeler Mfg. Co. A new depar has recently been installed for the ma ture of enameled fenders and almost ruples their former capacity.



WOODWORTH DETACHABLE TREAD

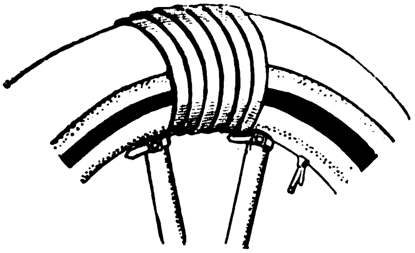
Prevents punctures, skidding and wear.

You can put them on your tires without removing the tires from the wheels.

They will be catalogued next season by all leading jobbers.

Send for circular and prices.

The Automobile Tire Emergency Strap



Does for the automobile tire what tape does for the bicycle tire. ¶ Made of special chrome leather absolutely unaffected by water. ¶ Is applied by buckling one end to a spoke, winding tightly around the partly inflated tire and buckling the other end. ¶ Will enable a person to run a hundred miles with a bursted, rim-worn or badly cut tire-shoe. ¶ Makes it safe to take long trips without an extra casing. ¶ *One size fits all tires.*

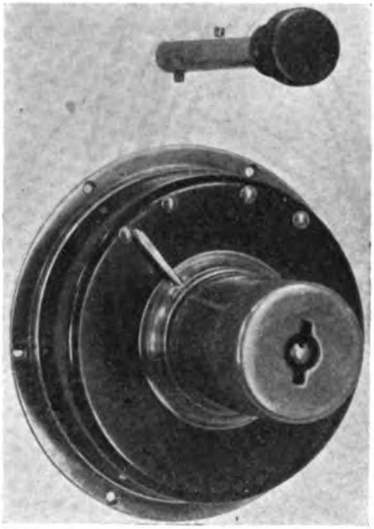
PRICE, $1.50 EACH

For Sale by dealers, or sent postpaid on receipt of price.

LEATHER TIRE GOODS CO.
NEWTON UPPER FALLS, MASS.

Lock Switch Co.'s Switch and Tire Gauge.

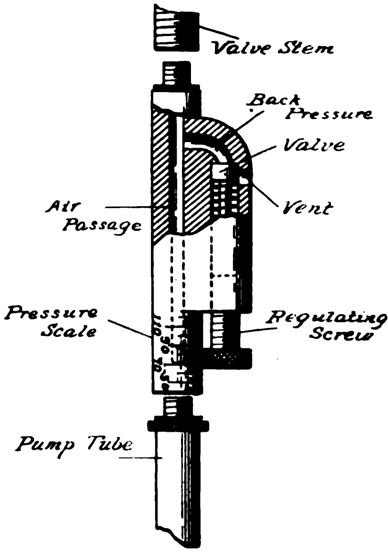
Lock Switch Mfg. Co., 20 Broad St., New York, have two meritorious specialties on the market, one a lock switch for the ignition system of gasoline cars and the other a pressure gauge for tires. In designing their lock switch they have provided for obtaining thousands of combinations by the arrangement of the circuit closing members with the switch, a specific form of plug or key being used to operate each combination. Each plug or key will control a plurality of circuit closing members, but no key or plug other than the one specifically designed for its particular switch will close the circuit within said switch. By operating the closing members within the switch by the key or plug, a closed circuit will be obtained by said circuit closing members being brought in contact with common terminals. These common terminals are so positioned that they will be engaged by the circuit closing members into whatever position with relation to each other said circuit closing members may be placed. The switch is also constructed in such manner that tampering with it with tools, wires or other devices will not be effective. The common terminals within the switch are not exposed and cannot be reached for the purpose of closing the circuit except with the proper plug or key.



The "Lock Switch."

This switch is constructed with a base of insulation into which is fitted a barrel containing a plurality of discs, the majority of which are of insulating material, the others of metal. The metal discs are operated by the key or plug to engage the common terminals within the barrel. The common terminals project longitudinally into the barrel and through the discs. The discs within the barrel have a central opening adapted to receive the key or plug. In this central opening is a rod which is adapted to guide the key when it is inserted within the barrel. When key is rotated within the barrel, the proj ing parts on it will engage the metal d and cause them to engage the common te nals and close the circuit through the swi There are no exposed contacts in the swi

The tire pressure gauge is more of a ne sity than the average car user supposes. is said to be a fact that a large part of wear and tear on tires is due to impro inflation and that under or over inflation equally effective causes of wear. Every maker produces his tire under different co tions, and each make of tire should be infla to the particular degree which suits it. T company's tire pressure register enables to see just what pressure his tires are un It is a small device, going into the pocket, and is strongly but simply structed.

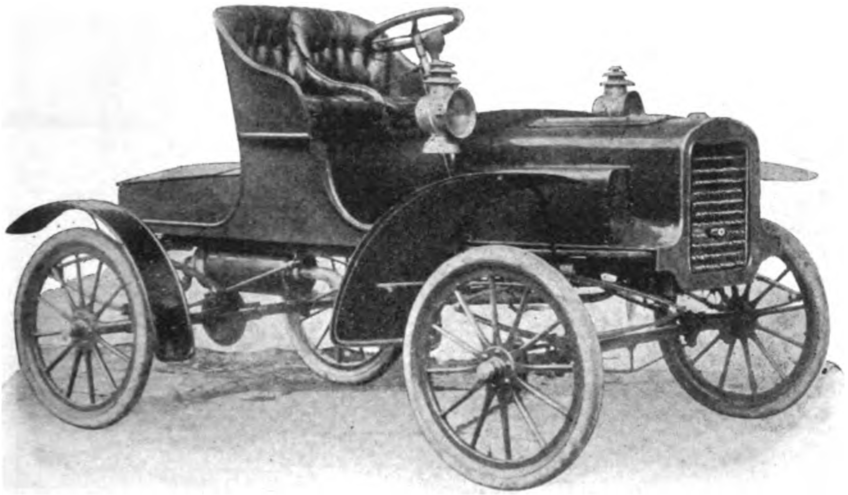


Lock Switch Company's Tire Pressure Gauge.

Owen Chemical Company, Cleveland, O manufacture a non-evaporating non-corro and non-crystalizing fluid for preven freezing of the circulating systems of auto biles, called No-More Auto Freeze. T solution, placed in the circulating system a gasoline motor, remains a fluid at 17 grees below zero, and is not detrimenta metal or rubber. It is sold in 5 and 10 lon wood jacketed cans for seventy-five c per gallon.

The Auto Equipment Company, 16 Ho wood Ave., East Orange, N. J., are putt out a valve grinding compound called " reka." This compound, for valves and ste gas and water-tight joints, is a clean, cutting compound, and always presents sharp cutting edge to the work, absolu free from scratching or grooving. Very li of this article is necessary to obtain first-c results, and it does not run over the eng or work. It is put up in 1 and 3-lb. c each consisting of three grades, coarse, dium and fine.

Walker Runabout



Model B

Price, $550.00. After April 1, $600.00

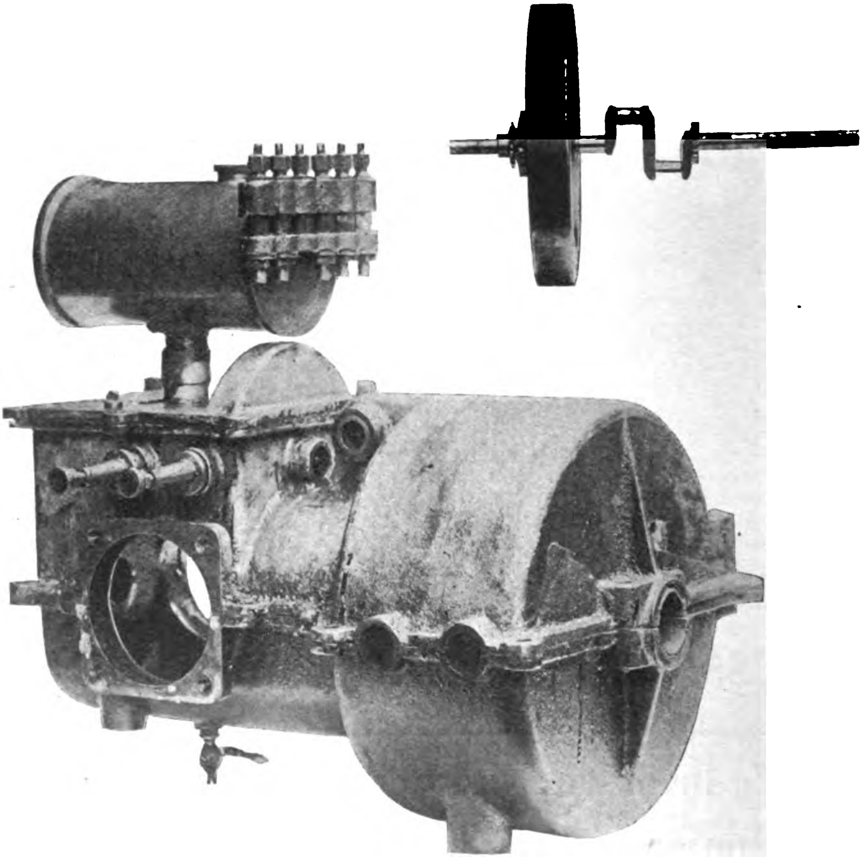
We invite you to inspect our Runabout for the season of 1906.

Walker Motor Car Co.

Detroit, Michigan

Write at once for agency terms.

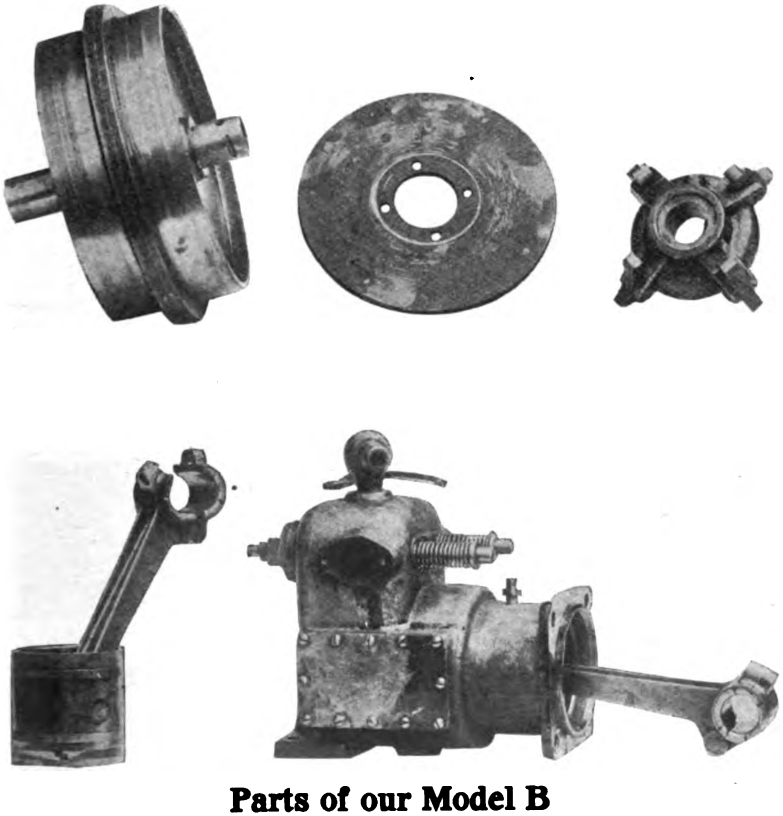
Walker
Runabout



Parts of our Model B

Walker Motor Car Co.
Detroit, Michigan

Walker Runabout

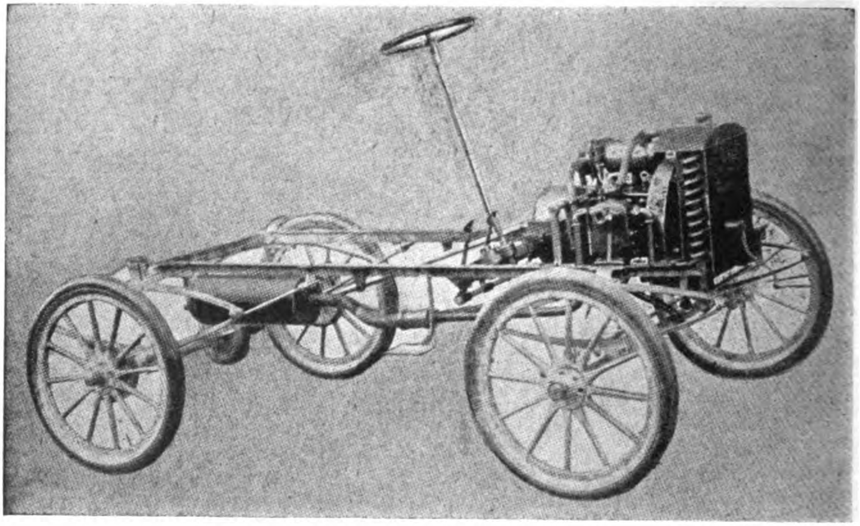


Parts of our Model B

Walker Motor Car Co.

Detroit, Michigan

Walker Runabout



Model B Chassis

Walker Motor Car Co.

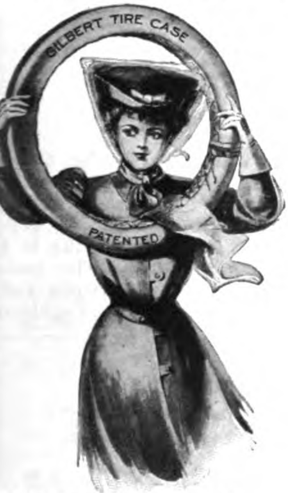
Detroit, Michigan

Live Agents Wanted

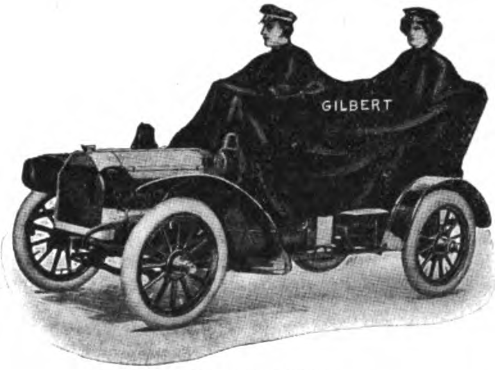
Gilbert Automobile Fabric Supplies

INNER TUBE CASE. **Price, $1.50**

LAMP COVERS. **Price, $1.50**


GILBERT TIRE CASE
PATENTED

GILBERT TIRE CASE
Price, $4.00



STORM APRONS.
Prices, $10, $14 @ $16

Send postal for new 1906 catalog.

To the Trade

We are ready to furnish you electrotypes.

Will be pleased to see our friends at the New York shows (space 173, Madison Square Garden. Space 66, 69th Regiment Armory).

GILBERT
Nº 3

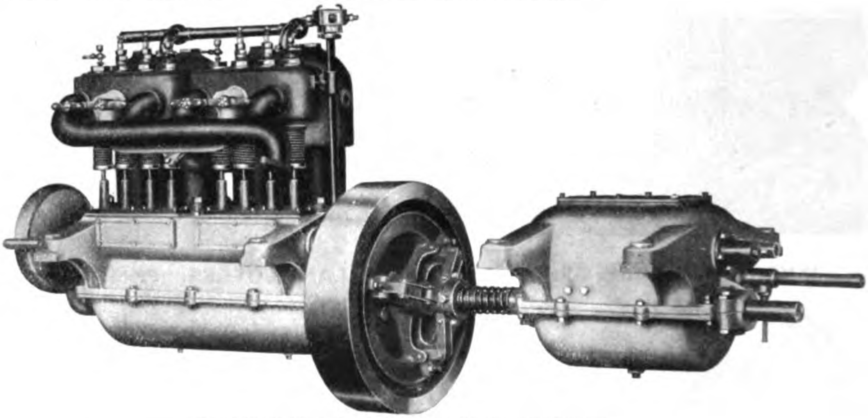
STEERING KNUCKLE BOOTS
Prices, 50c. to $1.00

LEGGINGS.
Prices, $2.00 to $3.50

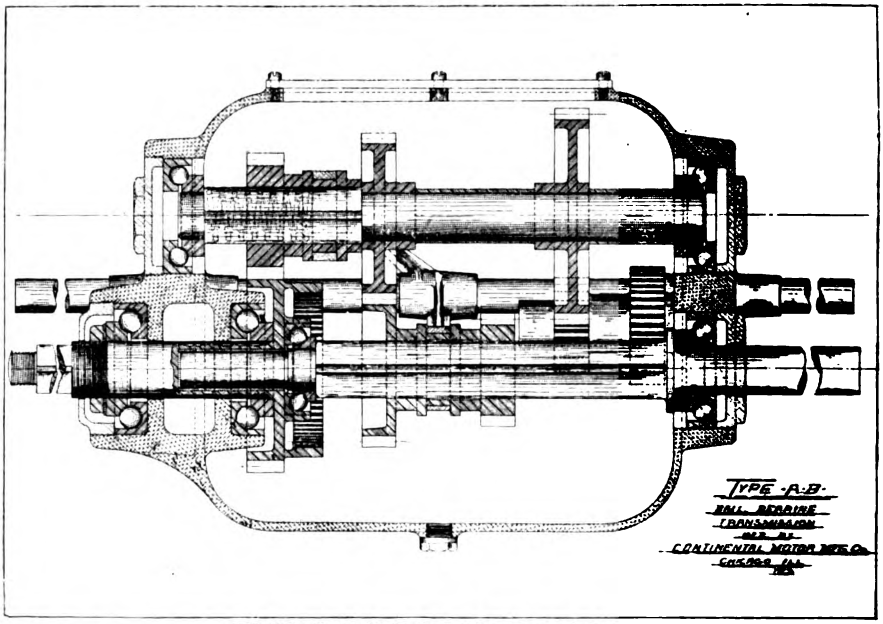
THE GILBERT MFG. CO. **New Haven, Conn.**

"Continental" 1906 Engines, Clutch and Transmission

For 1906 Continental Motor Mfg. Co., 240-244 W. Lake Street, Chicago, Ill., are offering four sizes of their 4-cylinder motors, 20, 24, 30 and 40 horse power. In these motors the cylinders are cast integral with the water jacket and valve chambers. The pistons are of extra length, and are fitted with four eccentric rings, with lap joints. The pistons are of sufficient length to enter the case and pick up the oil splash. White bronze bearings are fitted throughout. A vertical driven timer with ball bearings is furnished with each motor, and the vertical shaft has ball bearing thrust with provision for take-up for wear. Cylinders, pistons, rings and crank shaft are all ground to an exact fit.



"Continental" 1906 Motor Clutch and Transmission.



1906 "Continental" Ball Bearing Transmission.

Their new transmission is made with ball bearings throughout, and affords three forward speeds and one reverse with a direct drive on high speed with all gears out of mesh. The case is aluminum, and transmission is ma in several sizes to line up, and operate w their various sized motors. An import feature of their outfit is the frictional r clutch. The frictional members consist three rings, the centre one of which is phosphor bronze. Heavy studs are inser in the inside rim of the fly wheel and th studs engage in the slots in the centre ri this member revolving with the fly wh The other two rings are made of mallea iron, the rear one being cast with th spokes with heavy hub, which is keyed transmission shaft. The front ring is a chined faced ring casting. The phosp bronze ring is compressed between the outside rings by toggle joints. Provision adjustment and take-up for wear is affor by means of set screws held in place by nuts. The toggle joint links are made heavy sheet steel and all parts are made cure with bolts and cotter pins. The clu is furnished with operating sleeve, with

The Mosler Spit Fire Spark Plugs

MOSLER
PAT. SEP. 13. 03.

Actually "SPIT FIRE" where others spark only

ENERGETIC IGNITION GREATER POWER

And stand more **SOOT, OIL** and **WATER** than any other Plug

Base acts as Condenser of Electricity

Economizes Current Facilitates Sparking

Forms Compression Chamber Makes Plugs Spit Fire

Protects Porcelain and Sparking Points

A TRIAL IS CONCLUSIVE

Standard size, **$1.50** postpaid

With patented protector, $2.00

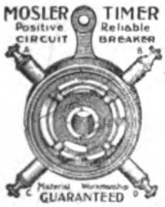
Made to fit any engine, any thread

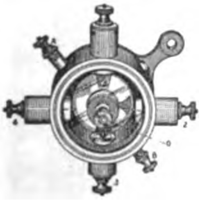
Write now for 1906 Illustrated Catalogue of **Mosler Ignition Outfits**

Special Discount to Manufacturers

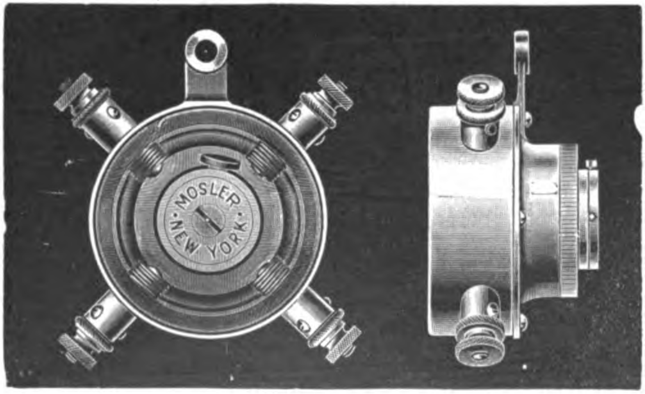
The Mosler Timers and Distributers

Run in oil, in either direction. Not affected by engine speed. Self adjusting. Multiple cylinders set as easy as one. Self contained.


MOSLER TIMER
Positive CIRCUIT
Reliable BREAKER
Material Workmanship
GUARANTEED



Timer and Distributer


MOSLER
NEW YORK

Ball Snap Timer

A. R. MOSLER & CO., 1679 Broadway, New York

We hope to see you at the Madison Square Garden Automobile Show, Space 202, January 13th to 20th, Inclusive.

movable brass collar which has two lugs for engagement with operating fork. A heavy special oil-tempered steel coiled spring is furnished with each clutch.

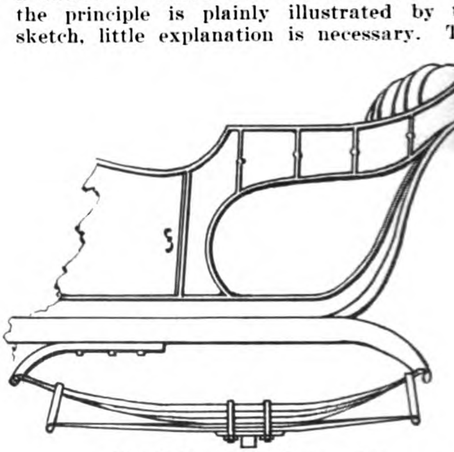
The Kelsey Self Adjusting Spring Suspension.

C. W. Kelsey, 317 West Fifty-ninth Street, New York City, manufactures a self-adjusting spring suspension for automobiles which efficiently absorbs all shocks occasioned by the rebound of the springs, but in no way interferes with their downward movement. The construction of the Kelsey device is simple, but its action is effective. A central disk, which is fastened to the frame of the car by bolts C, C, has four cam slots in its periphery, in which are the rollers D. D. D. D. Bearing on these is a steel friction band B, split crosswise to give a certain elasticity as the rollers come and go, around which is a fibre band, K, that takes the thrust between B and the split hub L of the arm A. The back end of the hub is split and has two extending lugs to the lower one of which is secured a bolt, which passes freely through the upper lug. Bearing on this lug and pivoted on the bolt is a cam with the upwardly extending arm F, which in turn is connected to the arm A by the helical spring G. This spring is adjustable in its tension by virtue of the rod passing through F. The arm A is connected by the adjustable rod H to the spring I of the car.

When the car goes over a bump the frame E moves toward the spring I and consequently throws up the arm A. This action is without resistance on the part of the device. When the frame and spring tend to separate, however, the four rollers engage with the friction band B and cause a braking action to take place between the friction band and the fiber band. The brake is at all times
self-adjusting both as to tension and we
by means of the cam bearing on the up
lug of the split hub and the spring G
degree of tension being governed by the
bolt passing through F. Thus is obtai
a self-adjusting suspension which only che
the rebound of the spring, allowing a natu
action of the spring in its deflecting actio

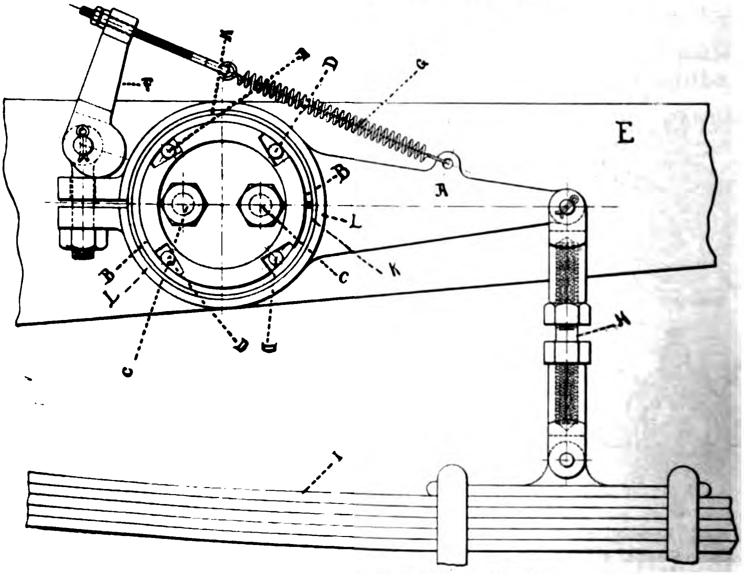
The Halfpenny Auxiliary Spring.

Martin Halfpenny Spring Co., 18 P
street, East Pontiac, Mich., has devised
new form of auxiliary spring for motor c
a sketch of which we show herewith.
the principle is plainly illustrated by
sketch, little explanation is necessary.

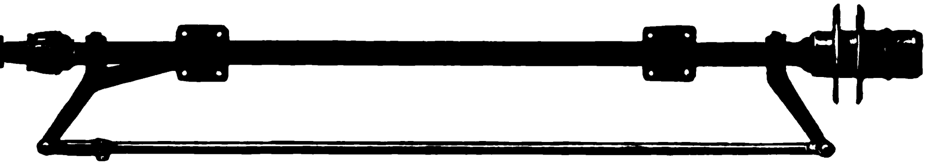


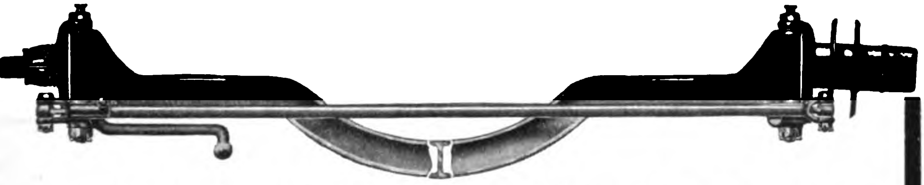
The Halfpenny Auxiliary Spring.

auxiliary spring is a steel ribbon or
bent into channel form and placed open s
up on the axle perched in the centre of
base of the channel, the two upward exte
ing ends come into contact respectively w
the forward and backward ends of the spr
at its under side.



The Kelsey Self-Adjusting Spring Suspension.





For the Automobile Builder who thinks the best axle construction obtainable is none too good for the car his customer will drive. We make a complete line of

FRONT AND REAR AXLES

embodying most every type of construction from the lightest Runabout to heaviest auto truck.

All types of rear axles including shaft drive, also clutch drive or floating type.

Single chain drive and Square Dead Rear Axles of the various types.

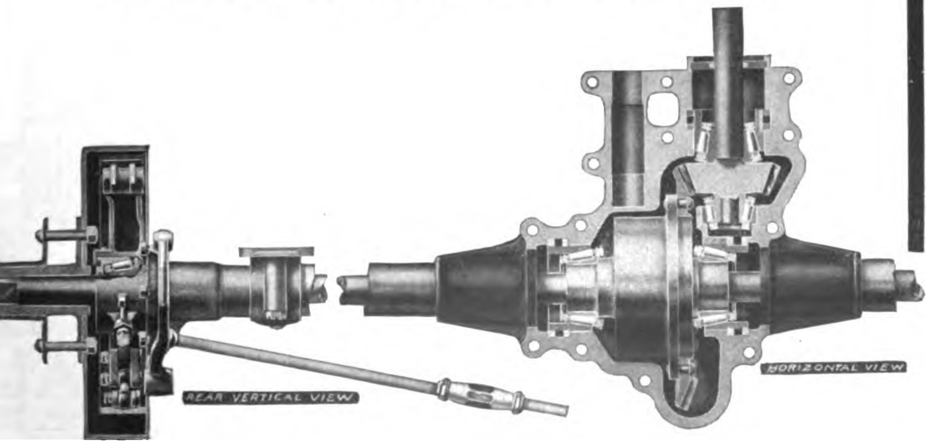
Timken Roller Bearings for all classes and conditions of work.

Hubs, steering knuckles, wheels and channel rims.

Get it from us and get the best. We invite correspondence.

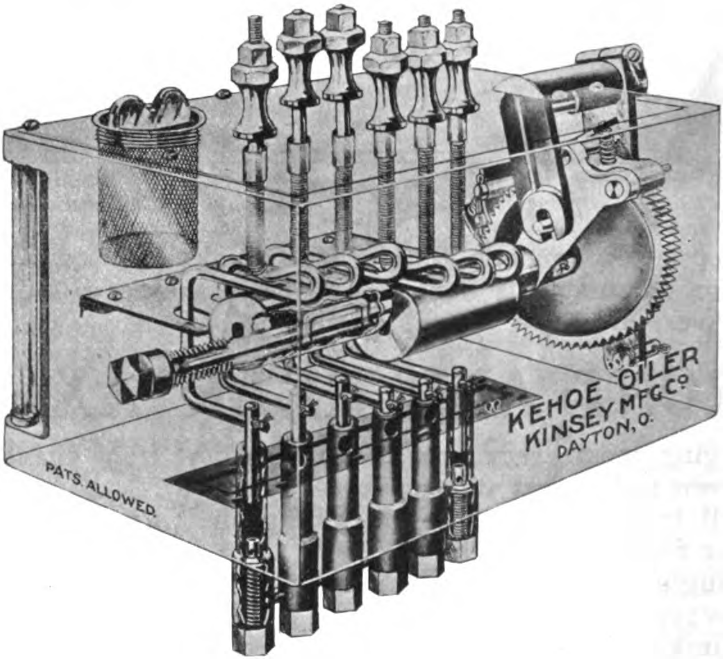
Timken Roller Bearing Axle Company,

Works and General Office,
CANTON, OHIO.
EASTERN BRANCH: No. 219 West 46th St., New York City.



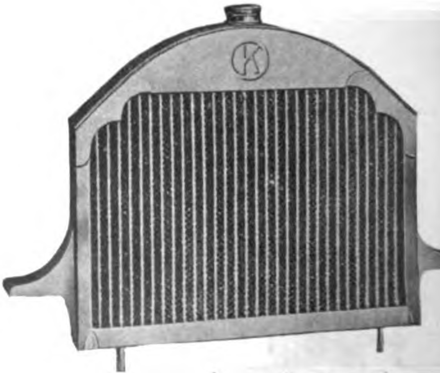
"Kinwood" Oilers, Radiators, Etc.

Kinsey Mfg. Co., Dayton, Ohio, are manufacturing a number of special automobile parts, including the oiler and radiator here shown. The oiler has been designed with a view to producing a device which would deliver to each bearing whenever the motor is run any desired quantity of oil in proportion to the speed of the motor. Each feed of the "Kinwood" oiler can be regulated from 1-3 drop to 15 drops for every 320 revolutions of the driving shaft. It starts with the motor and ceases feeding the instant the motor stops. This oiler gives a pressure when needed and as needed by each individual lead and each pump can be individually worked by hand without changing the adjustment if it is desired to flood the bearing. This oiler has no stuffing box below the oil level and therefore does not leak. The adjustments are outside of the case and are easily regulated, but remain constant until changes are made. The construction is simple and no parts are subjected to unnecessary wear. While not easily disarranged, all parts are easy of access if repair or adjustment is necessary. It has a large oil capacity in proportion to its bulk and is light in weight.



"Kinwood" Oiler.

The "Kinwood" radiator is of the flat vertical tube variety, its great efficiency being due to its peculiar fin construction. As radiation takes place quicker from points and edges than from any other portion of a fin the efficiency is secured by a large percentage of edge fin surfaces all close together and having large contact surfaces with the body of water. In the "Kinwood" radiator the water spaces are 3 9-16 by 3-16 in., allowing an unobstructed flow without danger of stoppage by scale or small particles of dirt; als
thin enough in connection with the large fi
surface to cool the water rapidly. The fla
tubes are flanged into tanks at top and bo
tom and are of such shape that decided cry
talization from cold does not cause leak
The wide flat tube construction is contin
ous from the front to the back of the rad
tor. As the joints in this radiator are f
in number, repair is easily made if necessa
besides all joints can be reached from t
outside with a soldering iron. The constr
tion is such that it can be subjected to
considerable of freezing without damage.



"Kinwood" Radiator.

The "Kinwood" radiators and oilers w
designed and invented by the Kinsey
Co.'s superintendent, Thos. J. Kehoe,
was formerly experimenter for the Wi
Co.

The Kinsey Mfg. Co. also make bo
fenders, tanks, of any desired styles

BUY TIRES

FROM HEADQUARTERS

We are one of the largest tire houses in America. We andle all makes, and can supply tires for automobiles, bicycles, aby-carriages, fire-engines, and commercial and pleasure vehi-les of all kinds.

There is an advantage in buying all your tires from one oncern. You are sure of prompt service and liberal treatment, nd save a portion of your transportation charges.

We are Philadelphia agents for

FIRESTONE TIRES,

—both solid, pneumatic and

CONTINENTAL TIRES,

—made in Germany, and the best imported tire on the arket.

The "GIBNEY SPECIAL"

Bicycle Tire is one of our leaders. It is a thoroughly good, re-iable and long-wearing equipment for your wheel.

Automobile Accessories and Supplies.

After January 1st, in addition to our tire business, we will handle a full line of **Automobile Supplies.** We are at present importing novelties and the best standard automobile supplies from the leading manufacturers in Europe ; in addition to this, we will handle all the standard American makes of all meritorious articles in the automobile supply line.

JAS. L. GIBNEY & BRO.

211-213 N. Broad St.
PHILADELPHIA

sizes; pressed steel frames, one piece pressed steel dashes, 4 in. deep, brass mouldings for steps, tool and battery boxes, gasoline gauge, which will show the height of the gasoline in the dark as well as in daylight, and other specialties in sheet metals.

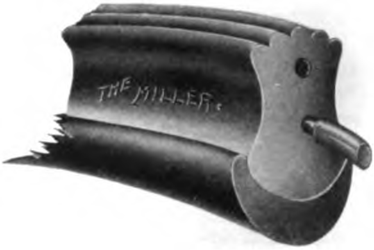
The Hendee Mfg. Co.'s New Factory.

The Hendee Mfg. Co., Springfield, Mass., manufacturers of the well known Indian motor cycle, recently took possession of a brick building 150 feet by 50 feet, and four stories in height. This new factory is moderately equipped and will be used exclusively for the manufacture of Indian motor cycles.

The ground floor is used for the motor cycle and frame building, finishing department, tank, nickeling and brazing departments, blacksmith shop, receiving and shipping room, and the metal department for the tri-car seats and vans. Second floor is occupied by the offices, machinery department and tool room. The carburetor, wheel trueing, repair, stock, assembling and testing out departments are on the third floor. The fourth floor is used as an enameling and upholstering department for tri-car seats.

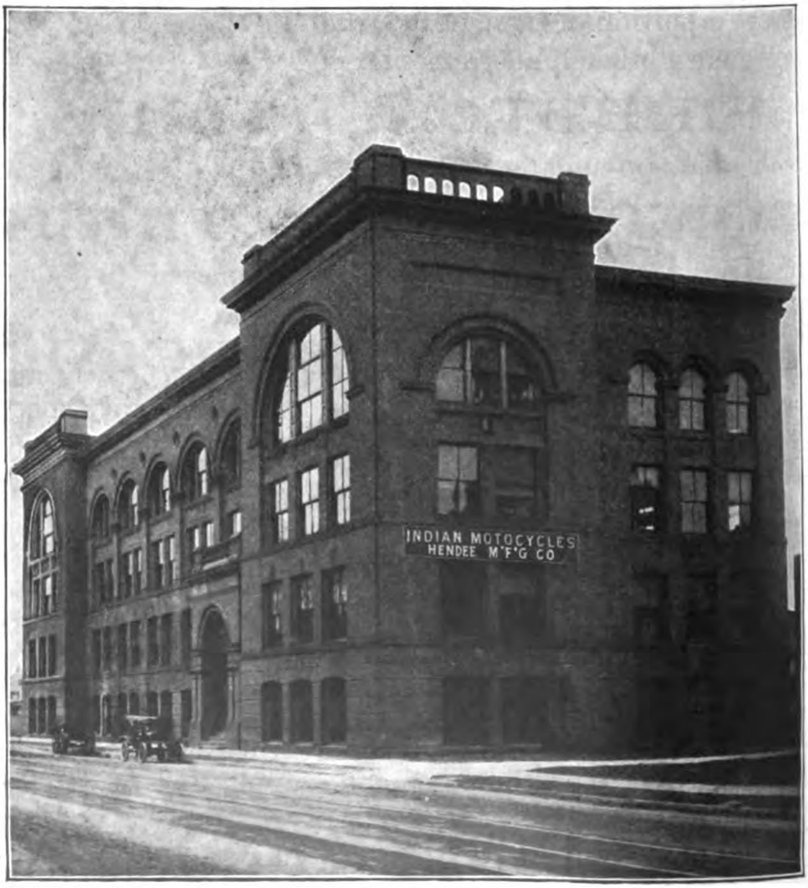
The Miller Solid Rubber Bicycle Tire

Chas. E. Miller, 97-101 Reade street, Ne
York City, has recently brought out a sol
rubber bicycle tire having a new and i
portant feature in the method of fastenin
to the rim. In addition to the cement a ⅛ i
steel wire is inserted through the rubber an

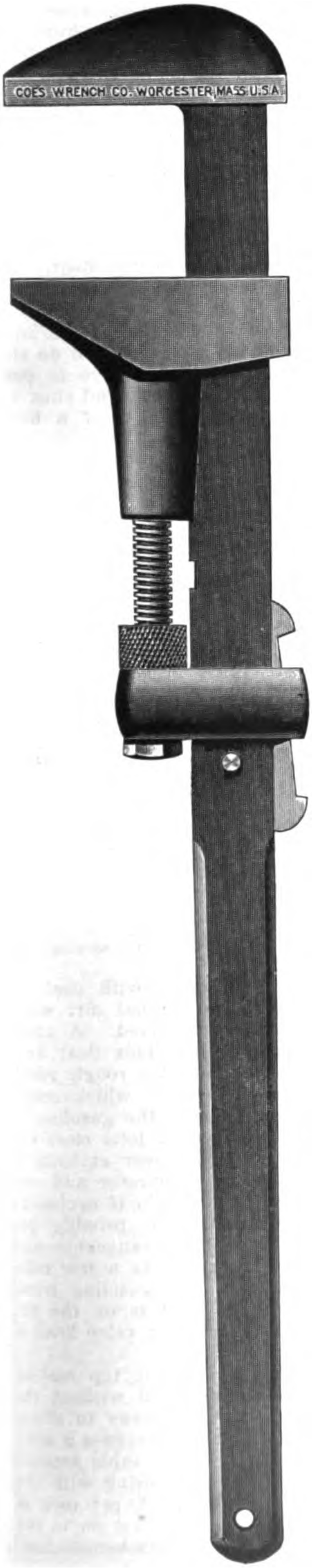


The Miller Solid Rubber Bicycle Tire.

wrapped around the felloe. The ends are s
curely connected by means of a brass tur
buckle. This style tire is durable and,
course, puncture-proof. It cannot come loo
from the rim and is claimed to be nearly
resilient as a pneumatic tire.



New Indian Motor Cycle Factory.

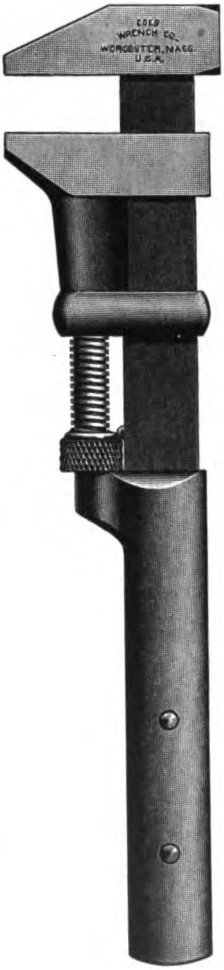

COES WRENCH CO. WORCESTER, MASS. U.S.A.

IF you run a Garage or own an Auto, you need these wrenches.

The Key Model. (Left cut.)

28 in. and 36 in. long, largest nut wrench made. Strong, unbreakable, handy and cheap.

Will replace a dozen forged special wrenches.


COES WRENCH CO. WORCESTER, MASS. U.S.A.

The ★ Steel Handle (Right cut)

in seven sizes—from 6 in. to 21 in. Heat, damp, and wear proof. Steel handle. 30 per cent stronger, size for size, than any imitation or substitute.

Every wrench fully

WARRANTED.

No advance in price.

Coes Wrench Co.

Worcester, Mass.,

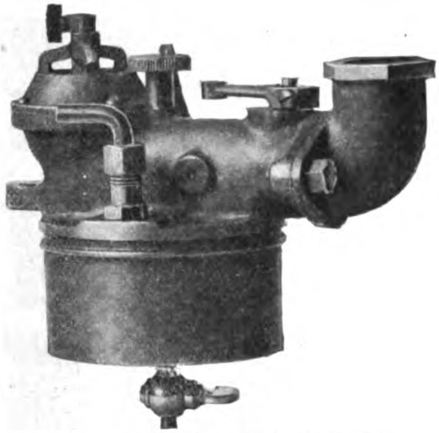
Or Your Dealer.

Ask for "Coes Genuine."

CIRCULARS

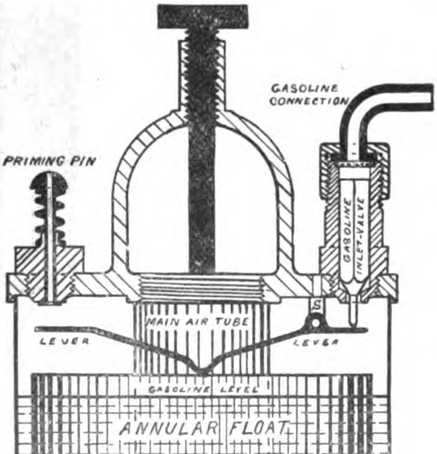
The "Breeze" 1906 Carburetor

The accompanying cut illustrates in detail the 1906 model of the "Breeze" carburetor, which is made by the Breeze Motor Mfg. Co. of 33 Court street, Newark, N. J. The Breeze automatic carburetor is a high grade product, simple to adjust and has few working parts. The top is a casting, the base is of spun brass which is both light and clean. It is not necessary to prime these carburetors to start an engine if the gasoline is of good grade.



Exterior view "Breeze" 1906 Carburetor.

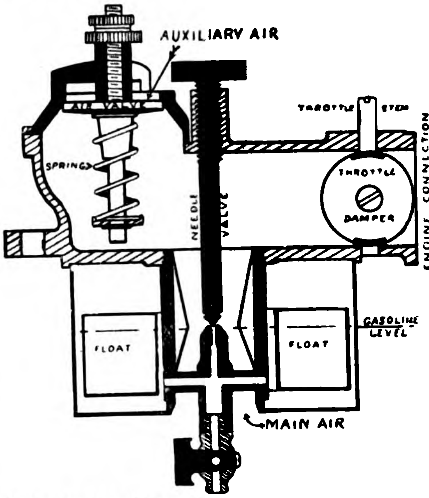
The main air supply enters at the bottom and is drawn past the spray nozzle, the orifice of which is controlled by a peculiarly shaped needle valve which converts the jet into a fine spray. The diameter of the air pipe is constricted around the spray nozzle to increase the air velocity at this point. The auxiliary air valve opens as more air is required at higher engine speeds, it is made of a light and strong aluminum alloy and provided with a simple means for adjustment.



Sectional View "Breeze" 1906 Carburetor showing the float and the gasoline passage.

The throttle is of the ordinary butterf type with a stop which can be placed s that the throttle can be operated from ar direction. The throttle can be set to ope or close in either direction. Carburetors a made with a flange and flanged pipe co nections to match are furnished with eith vertical or horizontal outlet. The float of spun brass and operates the gasoline inl valve through a lever hinged on the t casting.

The lever always rests on the float, ar when the gasoline level drops, the float ar long arm of the lever fall with it, liftir short arm of the lever which opens the inl valve. As the gasoline level rises so do th float and lever till the inlet valve is pe mitted to fall by its own weight and shut o the supply. The inlet valve is of a har alloy and the seat improves with use. can be removed for cleaning out dirt whe the gasoline pipe is disconnected. A sma strainer is fitted above it. This float fe mechanism is not affected by rough roa because any upward vibration which mig open the valve would throw the gasoline the same direction, downward jolts close t valve all the tighter. The lever extends the opposite side of the carburetor and c be depressed by the priming pin if necessa for starting. The position of priming p and gasoline inlet are interchangeable a can be changed to either side in a few mi utes without deranging the gasoline lev The needle valve adjustment is on the t of the carburetor and the large valve head indexed.



Sectional View "Breeze" 1906 Carburetor showing th air passage.

The base is screwed into the top casti and can be unscrewed by hand without t use of tools. This makes it easy to clea The arrangement of gasoline passages is su that dirt or water to a considerable amou may be present without interfering with t operation of the carburetor. A pet cock furnished and there is a boss cast on to t top casting to which a brace can be attach

Special Announcement

¶ We are prepared to fill orders promptly for a STANDARD LINE OF AUTOMOBILE SUPPLIES. This department will carry only reliable goods. It will not make a specialty of seemingly low prices which are based on job lots of supplies which are not standard either in design or quality. We propose to sell only reliable goods, and if you deal with us you can depend upon getting the best automobile supplies that can be purchased at prices which are reasonable. Liberal discount to the trade. Send for Catalog.

Bicycle Sundries

¶ We are, as usual, leaders in the bicycle sundries line, carrying everything, from the smallest to the largest part. Send for our latest catalog and price list.

Manufacturers' Supplies Co.

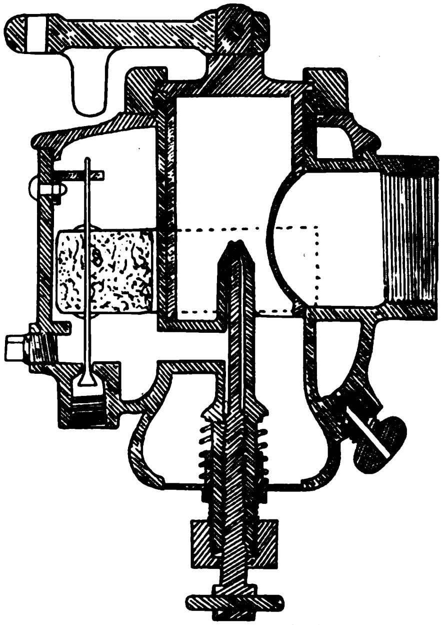
418 Arch Street, Philadelphia

The gasoline connection furnished is a union with a short ¼ in. diameter tube for soldering or a standard ⅛ in. or ¼ in. pipe fitting as desired. The gasoline inlet valve and guide, the auxiliary air valve mechanism or the entire base of the carburetor can be detached for inspection, adjustment or cleaning without removing the carburetor. This carburetor is not easily accessible. Prices are: $10 for the ¾-in. pipe size; $15 for the 1-in. or 1¼-in. size; $25 for the 2-in. size, and $60 for the 3-in. size.

The Schmidt Carburetor.

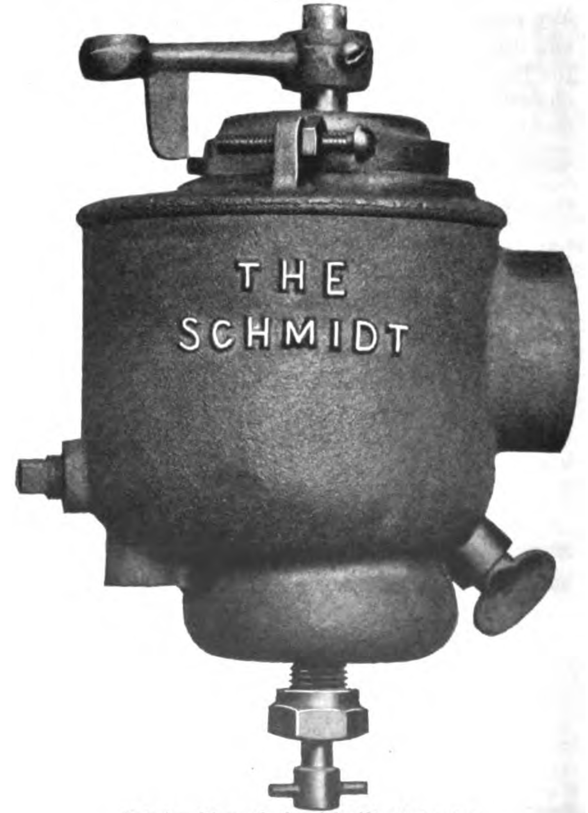
The Minnesota Boat and Power Works. Stillwater, Minn., manufacture the Schmidt carburetor, which is constructed entirely of brass, nickel and silver and contains no parts that will corrode or rust. The float is made of heavily shellacked cork. Gasoline supply and regulation radiate from center of carburetor and thereby prevents the mixture richness from being affected by the swaying of machine in rounding sharp corners; or, in marine service, by the rocking or tilting of the boat.

Practically all the attention required is the adjusting of the needle valve.



Sectional View of the Schmidt Carburetor.

When the motor is running at its minimum speed the air is drawn through an opening of fixed dimensions. As the speed is increased the suction requiring more air lifts the suction valve and by increased suction admits a larger proportion of gasoline. If the valve is closed the suction is decreased thereby decreasing the supply of gasoline. When a charge is throttled in this carburetor it is a complete charge, and not all air, or all gasoline, and no matter if the charge is large or small it is always of uniform richness, and on this depends the flexibility of an engine.



Exterior View of the Schmidt Carburetor.

POPE
BICYCLES

Finest Line of
BICYCLES
Ever Offered

Columbia,	**Price,**	**$40.00-$100.00**
Hartford,	**"**	**$25.00**
Cleveland,	**"**	**$40.00-75.00**
Westfield,	**"**	**$25.00**
Tribune,	**"**	**$40.00-100.00**
Stormer,	**"**	**$25.00**
Rambler,	**"**	**$40.00-50.00-60.00**
Ideal,	**"**	**$25.00**
Crescent,	**Price,**	**$25.00**
Monarch,	**"**	**$25.00-40.00-50.00**
Imperial,	**"**	**$25.00-40.00-50.00**

JUVENILES

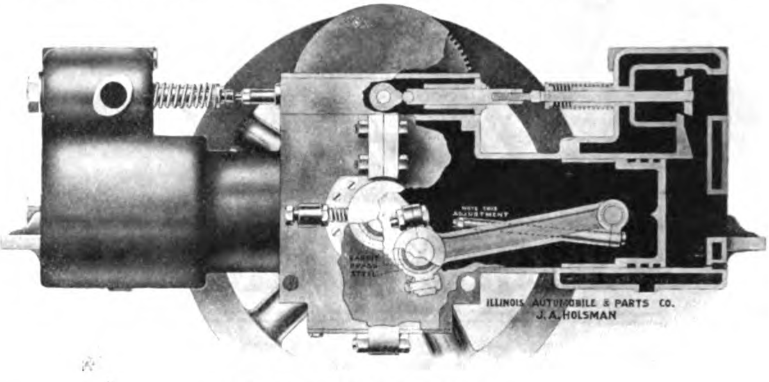
Fay	**26 inch wheels**	**-**	**$25.00**
Crescent,	**24 "**	**-**	**$22.50**
Ideal,	**20 "**	**-**	**$20.00**

If all these lines are not represented in your town, apply for agency.
See full information in our catalogue, which will be mailed on request.

POPE MANUFACTURING CO.
HARTFORD, CONN.

Holtz Gasoline Engine

Illinois Automobile & Parts Co., Main and Globe Streets, Peoria, Ill., have on the market a 2-cylinder, opposed gasoline motor of refined design, and possessing several good features of special merit. The cylinders are 5¼x5 in., and develop 16 horse power. The engine weighs 340 lbs., of which 90 lbs. is flywheel weight. The flywheel is 18 in. in diameter, and the engine is 37 in. long over all by 15 in. high over all. All valves are 5 in. in diameter. This engine has a speed range of 200 to 980 R. P. M. The bearings are very long, the end crank shaft bearings being 1¾x3 in., and the two middle bearings (crank shaft end of connecting rods) 1⅝x2⅝. Another good feature of this engine is the use of 4 piston rings, one being at the front end. Crank case, cylinder and head are cast integral of fine grey iron. Connecting rods are drop forged steel and are adjustable at both ends. The bearings on the crank shaft are all brass, boxes split and lined with ⅛ in. of babbitt metal. All bearings are adjustable, including the cam shaft bearings. The castings carrying the crank shaft and push rod bearings is separate from the crank case. The push rods are in line with the valves and are adjustable. The crank is a one-piece, weldless, forging. Top and bottom plates on the crank case are aluminum, and can be removed without disturbing the timing of the engine. Cylinders are bored and ground, the same machining being applied to the pistons.

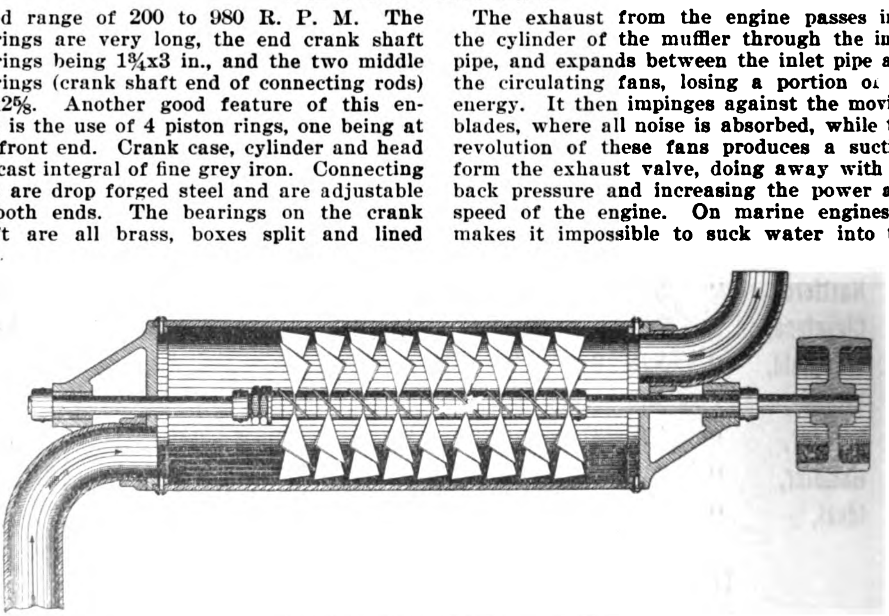


Holtz 16 H. P. Gasoline Engine.

The Davis Muffler and Power Developer

Charles P. Fonda, 421 Market street, S
Francisco, Cal., has placed on the market
muffler for gasoline engines which is claim
to not only perfectly silence the exhaust b
to actually increase the power of the engi
by drawing the burned gases from it and t
insuring a pure succeeding charge as well
clean spark plugs. No cut-out is needed w
this muffler, for it is said to give more pow
than an open exhaust.

The exhaust from the engine passes i
the cylinder of the muffler through the in
pipe, and expands between the inlet pipe a
the circulating fans, losing a portion o
energy. It then impinges against the movi
blades, where all noise is absorbed, while
revolution of these fans produces a suct
form the exhaust valve, doing away with
back pressure and increasing the power a
speed of the engine. On marine engines
makes it impossible to suck water into
cylinder.

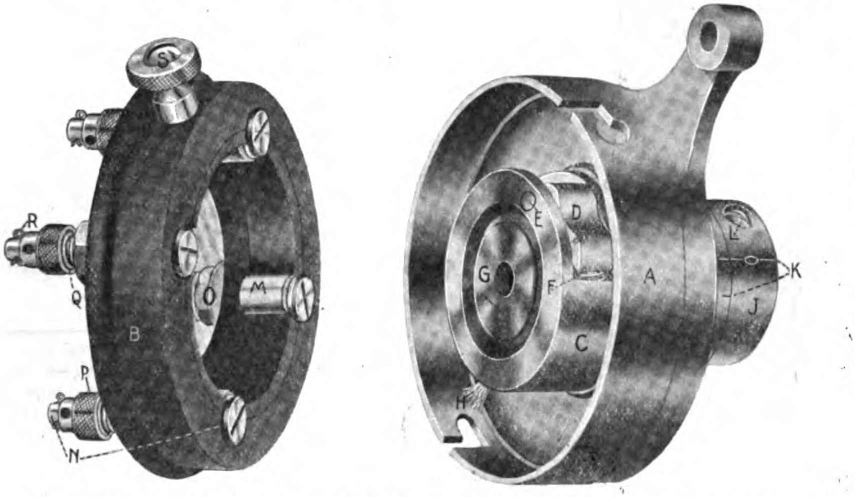


The Davis Power Developer and Muffler.

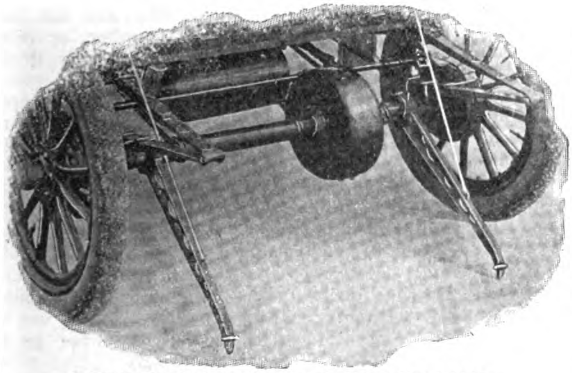
The vanes are rotated by means of
sprocket and experiments with device so
have been mostly at speed ratios of 6 to
at higher speeds a greater increase of pow
is obtained and it is not yet known at h
high a speed the device can be successfu
run.

Mr. Fonda is also putting out a non-fl
oil for bearings which he calls "It." It
tails at 25 cents a large can.

This is it!
THE PERFECT TIMER



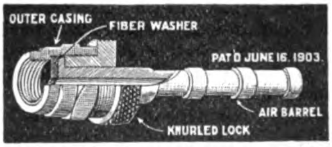
The **most simple, durable and efficient timer** ever offered the automobile trade. The universal timer difficulties are practically eliminated. No intricate or delicate parts to get out of order. Accessibility is a strong feature, as it can be taken apart almost instantly. The bushings, while stationary, are so attached that they can be turned to allow for any unusual wear, giving absolutely four new points of contact. All parts subjected to wear are made of tool steel, and hardened, this insuring the life of the timer for an indefinite period. Made for one, two, three or four cylinder engines. Write for catalog.



THE PERFECT DROP BRAKE

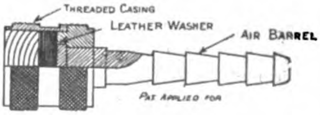
is the best safeguard against accidents which might be caused by the car backing down an incline, if the chain should break, or machinery go wrong. Every jobber should catalog it, and every dealer carry it in stock,

$4.00 per pair for 28, 30 and 32 inch wheels
$5.00 " " " 34 and 36 " "



Perfect Air Coupling

Makes an absolutely tight joint. This can only be done with a Fibre Washer. Has long stem to go into the hose, and is made from solid bar stock. Will not leak regardless of pressure.



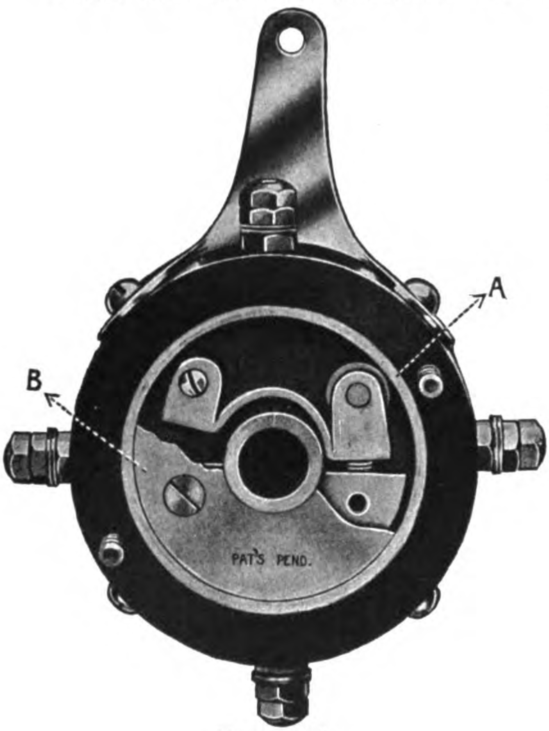
Perfect Junior Air Coupling

Has fewer parts, is less expensively constructed and sells for a lower price than the Perfect Air Coupling. Guaranteed to give satisfaction.

E. S. YOUSE, Manufacturer, Reading, Pa.

The 1906 "Ideal" Timer.

C. T. Altemus & Co., The Bourse, Philadelphia, have brought out a new primary timer which possesses great efficiency, its operation being founded on practical principles and the workmanship and material employed being the best. This timer they call the "Ideal," and it consists of a solid steel back, to which is rigidly fastened a seamless rubber ring, 3 ins. in diameter. To the inside of this hard rubber ring is fitted a steel ring with oblong openings, corresponding to the number of cylinders to be fired. Metal contact points are placed in these openings, insulated from the steel rings by means of fibre bushings. The three parts thus fitted together form practically a steel ring of fixed and true diameter. A centre core or spool revolves within this, and bearing on this metal ring, between the two flanges of the spool, is a steel arm pinned at one end, but free to move. The other end carries a chrome steel roll. By means of a helical spring directly under the roll support, the roll is constantly kept against the steel ring and contact points. When in operation, the roll passes over a steel circuit, making positively a wipe contact at all speeds. The entire core of the timer is packed with hard grease or vaseline, so that all moving parts work in a grease packed compartment. The "Ideal" Timer has no overhung bearings and the contact roller is between the flanges of the centre core, thus guaranteeing uniformity of running and perfect synchronism in sparking. The wearing qualities are obvious, since the action of the roll in the presence of grease on a steel path is practically indestructible.

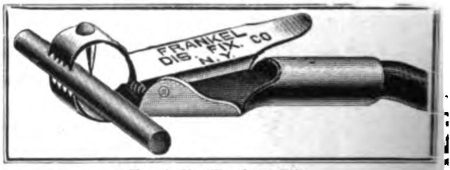


The Ideal Timer.

The single cylinder instrument lists at $4.50; the double cylinder at $5.00; the 3-cylinder at $5.50, and the 4-cylinder at $6.00.

Frankel's Testing Clip.

Frankel's Testing Clip Co., 177-179 Hudson street, N. Y., have recently placed on the market a clip for testing ignition wiring. It has heretofore been customary to skin the insulation from wires, but this device renders such a practice unnecessary. It is a snap clip with toothed jaws and these teeth grip the wire while a pin, which extends from one of the semi-circular jaws, pierces the insulation and comes in contact with the wire proper.


FRANKEL DIS. FIX. CO N.Y.

Frankel's Testing Clip.

The Du Brie Motor Co., 34 Brush street, Detroit, Mich., manufacturers of gasoline engines, etc., have recently installed a lot of the newest modern machinery, which enables them to double their output. This is their third business expansion since 1904. They expect to turn out ten engines a day and will now endeavor to fill back orders and keep up with new ones.

The "Radium Perpetual Cigar and Cigarette Lighter" is handled by The International Auto. and Yacht Agency, 119-121 Nassau street, New York City, who are the sole American agents. It is an ember, or pilole enclosed in a water-tight case easily fitting in the vest pocket, that immediately becomes incandescent but does not produce flame upon being exposed to the air. The weather in no way affects it. Putting on the cap stops the glowing immediately. Price is $1, postpaid.

The Chicago Auto Heater Co., 285 State street, Chicago, Ill., have recently brought out a new device for heating the interior of enclosed gasoline motor cars, called the "Hoffman Haury Heater." By the use of this heating device a car can be comfortably heated, without creating an odor, by the use of the exhaust which would otherwise go to waste. The device lists at $25.

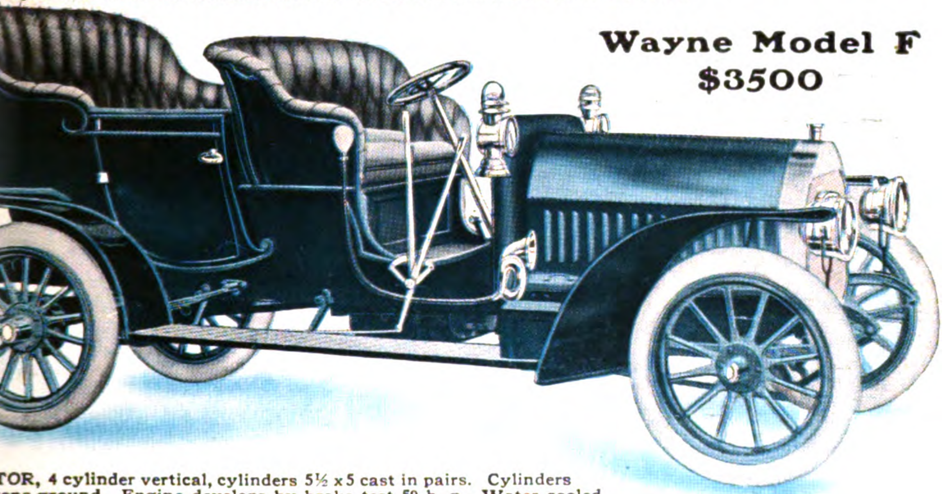
The Worcester Pressed Steel Co., Worcester, Mass., manufacturers of light and heavy stampings, cold forgings, pressed steel, etc., also manufacture wrenches, radiator parts, etc., for automobiles. The majority of this work, however, is from special designs of customers.

The subscription price of the CYCLE & AUTOMOBILE TRADE JOURNAL is $1.00 per year. This includes 4 or 5 special numbers which are worth 50c. each, in addition to the regular numbers. You will therefore receive $4.00 or $5.00 value for $1.00. Subscription blank will be found on page 444.

Wayne

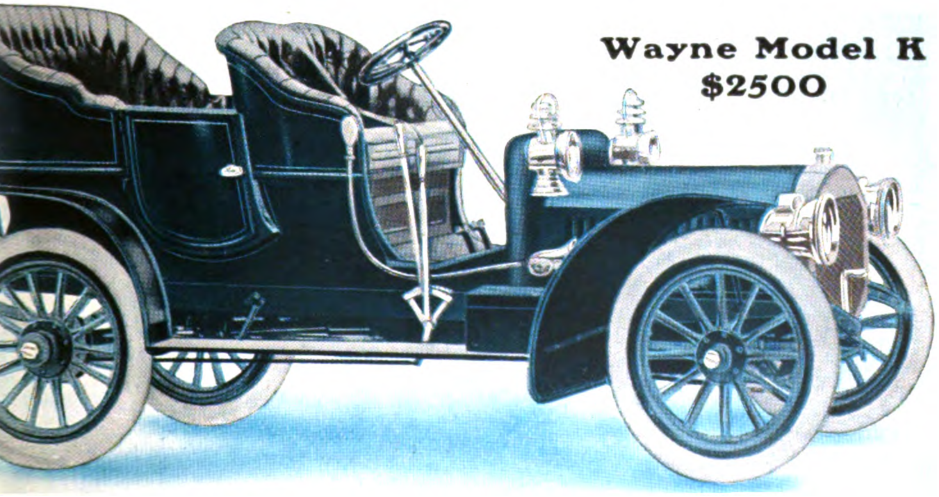
An Introduction to the Wayne Cars of 1906

appreciation accorded our cars last year warrants us in greatly increasing our capacity and in placing
he automobile trade improved types of Wayne cars. The four models we now present are the result of
experience. They are not new and untried experiments. Each car is a distinct type of Wayne design and
ction and each model has been built with a view to supplying the varied demand for high grade machines.
Vayne cars of 1906 the automobilist will be sure to find a car suited to his needs.



Wayne Model F
$3500

TOR, 4 cylinder vertical, cylinders 5½ x 5 cast in pairs. Cylinders
ons ground. Engine develops by brake test 50 h. p. Water cooled.
ON, jump spark with quad coil and storage battery· TRANSMISSION, sliding gear with three speeds for-
d reverse. Hess-Bright ball bearings throughout. REAR AXLE, shaft drive floating type. FRONT AXLE,
lrop forged, one piece, nickel steel. WHEEL BASE, 114 in. TIRES, 34 x 4½. EQUIPMENT, includes all
ry tools of the best quality, 2 side lamps; 2 acetylene head lights with generator, tail lamp and tube horn.



Wayne Model K
$2500

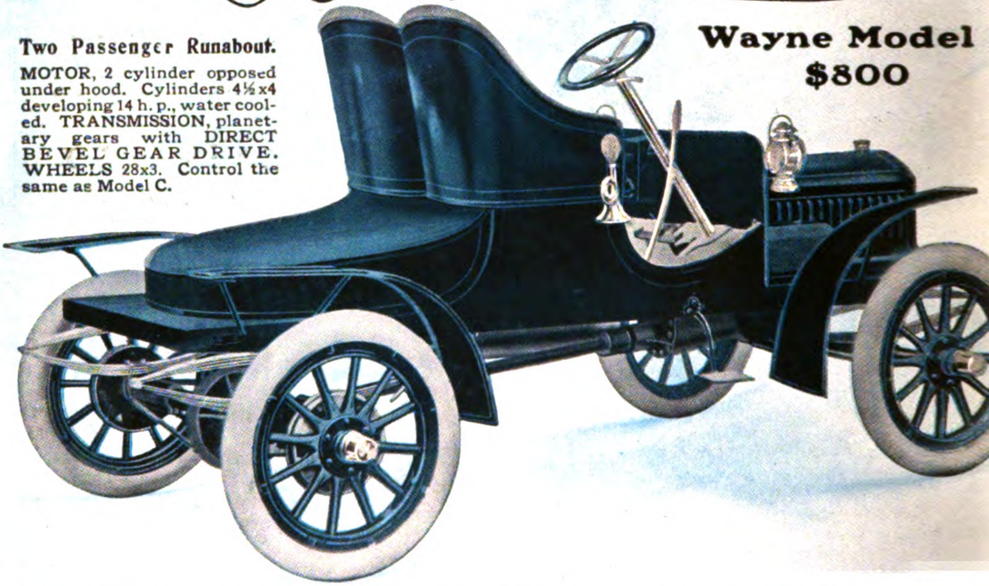
TOR, 4 cylinder vertical, cylinders 4¾ x 5 cast in pairs and water cooled. Engine develops by brake test
Cylinders and pistons ground. IGNITION, same as Model F. TRANSMISSION and Axles same type as
F. TIRES, 32 x 4. EQUIPMENT, same as Model F.

Wayne

Two Passenger Runabout.

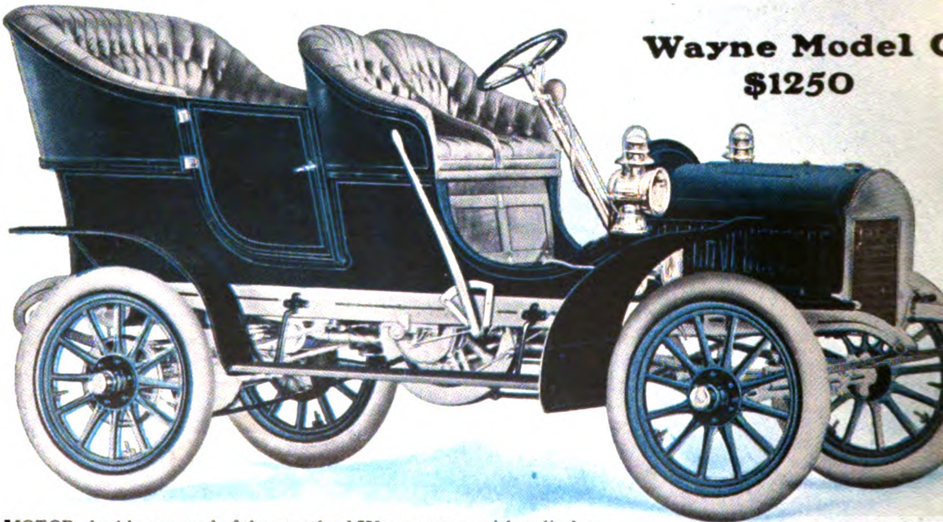
MOTOR, 2 cylinder opposed under hood. Cylinders 4½x4 developing 14 h. p., water cooled. TRANSMISSION, planetary gears with DIRECT BEVEL GEAR DRIVE. WHEELS 28x3. Control the same as Model C.

Wayne Model
$800



The strong features of this car are the extreme simplicity and accessibility of the engine and transmission. The crank case ar transmission case form one casting and the entire engine can be taken apart or assembled in half an hour.

Wayne Model
$1250



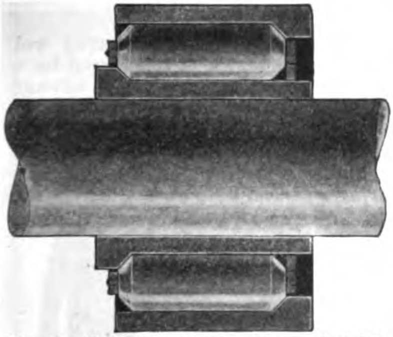
MOTOR, double opposed of the standard Wayne type, with cylinders 5¼x5. Engine is hung under the chassis frame and develops by break test 20 h. p. *This is the same type of car wh proved so successful last season, brought up-to-date and with all improvements.* TRANSMISSION, is of the planeta gear type with chain drive. CONTROL is by a single lever which engages the high speed clutch and rever The slow speed and brake are controlled by foot pedals. TIRES 30 x 3½. EQUIPMENT, complete set of too side oil lamps, tail lamp and horn. We want agents to write us about the Wayne cars for 1906. Agency arran ments can now be made for unoccupied territory. Write while you think about it, for full particulars.

Wayne Automobile Co., Detroit, Mich.

The 1906 Line of "Standard" Bearings Etc.

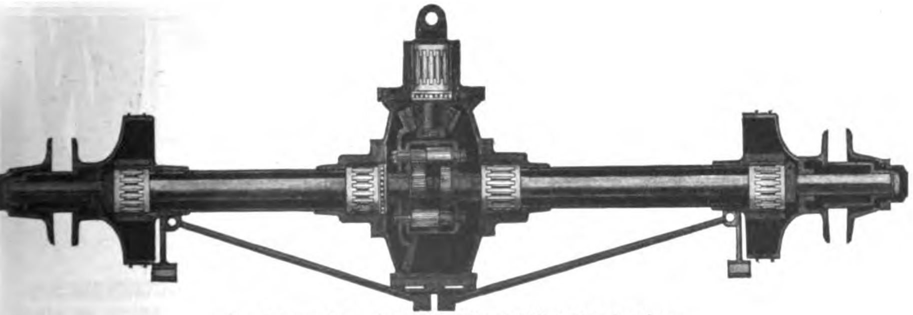
number of additions have been made to line of roller and ball bearings put out by ndard Roller Bearing Co., 49th and Gi- d Ave., Phila., since we last described their ducts, and the accompanying cuts indicate some degree the completeness of the line. should be said, however, that with the ny extensive additions to their facilities the completeness of the same, they are a position to meet all requirements in r line.

"Standard" Roller Motor Bearing Roll Cage



"Standard" Roller Motor Bearing Complete.

or motors they offer a type of roller ring which has been proved successful. consists of a steel sleeve to be fitted n the shaft, and a steel casing to fit over rollers in the box or housing. On one end the sleeve there is a shoulder, and upon other end of the casing there is a ilar shoulder, against both of which the veled ends of the roller bear and take up the l thrust or end strain of the bearing. hile this bearing is desirable for all classes of machinery, it is especially suitable for motors where there is more or less lateral motion. The beveled ends of the rollers prevent them from binding or twisting, and keep them always in perfect alignment with the shaft. The bearing runs satisfactorily at fairly high speed and for heavy weights. Any size required will be furnished promptly.



Bevel Gear Rear Axle with "Standard" Roller Bearings.

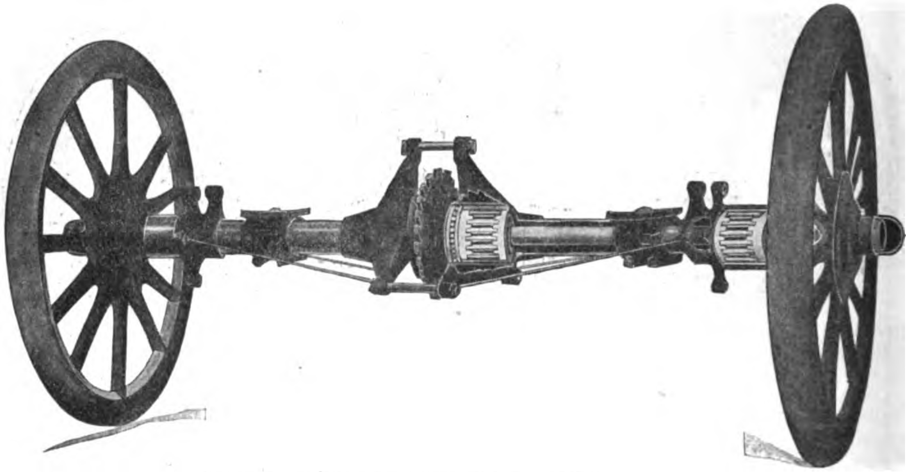
"Standard" Plain Roller Thrust Bearings.

They also carry a full line of artillery hubs fitted with "Standard" roller bearings as well as steering knuckles. They can also apply these bearings to any class of hubs. In addition to the designs of steeering axles shown they can supply steering knuckles of special construction and also all of the standard makes fitted with either "Grant" or "Standard" roller bearings. Or they will furnish them plain without bearings.

"Grant" Roller Cage.

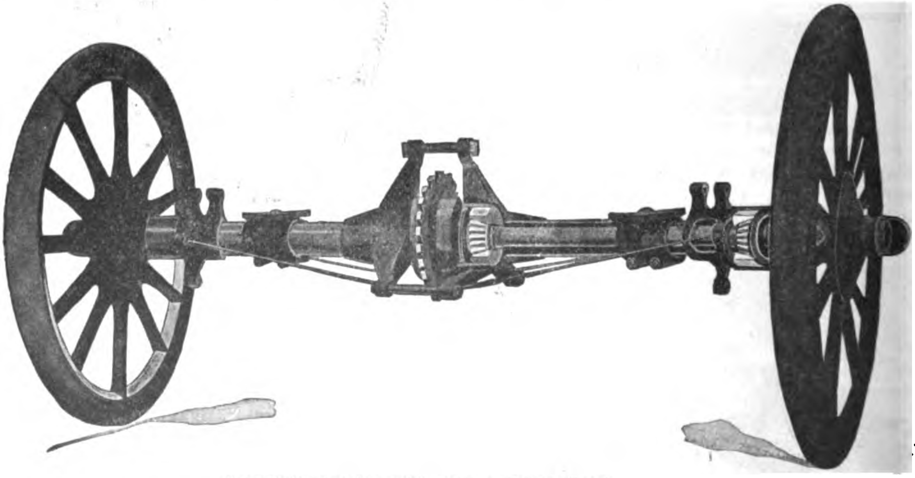
They carry a large number of standard sizes in stock. "Standard" roller bearings are composed of cylindrical members set parallel, but in their "Grant" type of bearing the rolls are placed in conical form.

The Grant tapered or conical rollers are held in a cage by a rivet through each roller, connected with a ring, the entire bearing being self-contained and in one piece.



Rear Axle with "Standard" Roller Bearings including End Thrust

The rollers bear their entire length. All rollers are ground accurately to the proper taper, fitted to bear properly on the cones and races, both of which are also of steel hardened and ground accurately, inside and out. On all of the sizes with 2 in. shaft diameter or less, the cones are made with a shoulder on the outer end, against which the large end of the rolls come in contact, for the purpose of taking the outer pressure or end thrust. On sizes larger than 2 in., a separate thrust collar or ring is furnished, which is fitted outside of the race. The ends of the rollers are made to bear against the shoulder on the cone or in the race in the thrust collar very accurately, and no interference with adjustment is caused by them.



Rear Axle Complete with "Grant Roller Bearings.

A double bearing is furnished for use c
rear automobile axles by which the thru
is taken in both directions. Several siz
of this class of bearing are carried in stoc
and special sizes can be furnished upon sho
notice.

The Grant axle, having tapered roller
can be adjusted, which is considered by son
automobile makers of considerable advantag

They are made in all sizes from 1 in. u
ward, the principal sizes in demand bei
1⅛ in. and 1¼ in. for light cars and 1⅜ i
1½ in. and 1⅝ in. or larger for touring ca
It is always desirable to use as heavy an ax
as possible.

The "Standard" line also includes comple
front and rear automobile axles, of standa
designs which they carry in stock, or c
supply promptly. In addition to those show
they furnish any size or style front and re
axle that may be required, fitted with eit
Standard or Grant roller bearings. Th
manufacture a full line of running gea
complete with differential gear, also be

SYRACUSE

Aluminum and Bronze Co.

SYRACUSE, N. Y.

Strictly High Grade

Aluminum
Bronze
Brass
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Manganese Bronze
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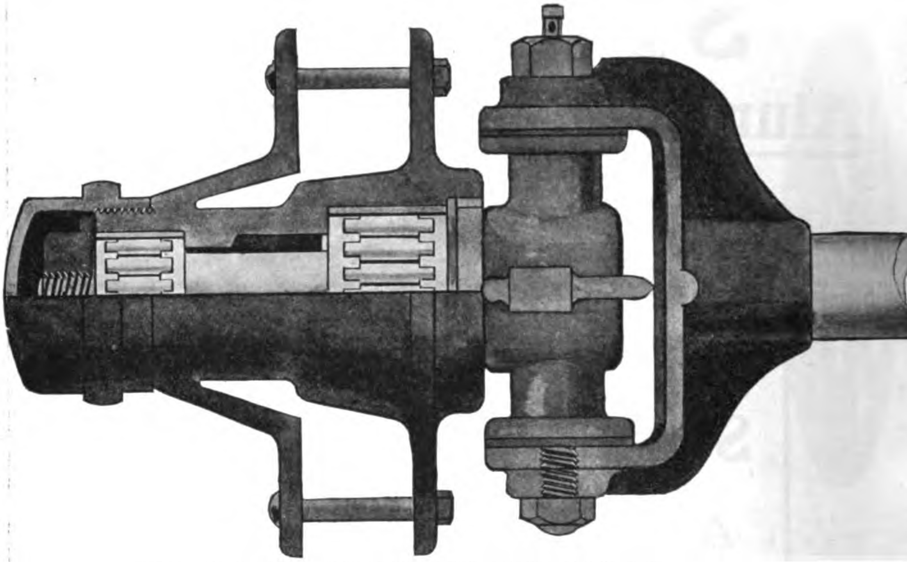
CASTINGS

Experience counts in making Aluminum Castings

We have been at it for years
Better not take chances

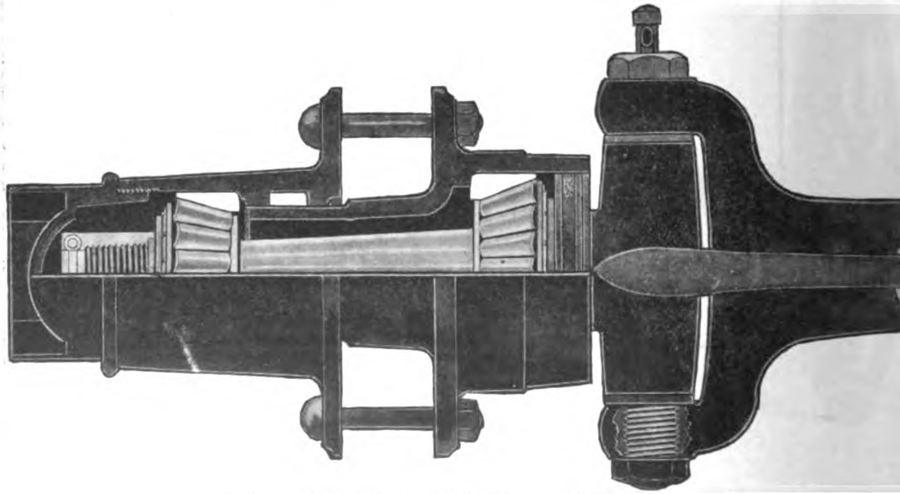
gear rear axle, shaft driven axle, and chain drive from gears attached to the hubs. Front axles made of tubing or of solid steel, of any shape or size, are furnished with the above, also fitted with either Standard or Grant roller bearings or ball bearings.



Heavy Type Steering Axle, Artillery Hub and "Standard" Roller Bearing Axle.

The wheels, including spokes and rims or channels, can also be supplied if required.

The regular Standard roller bearings and Grant bearings are suitable for use in spring clips for rear axles and for bearing for countershafts or jack shafts. When desired they can furnish spring clips or housings fitted with ball or roller bearings.



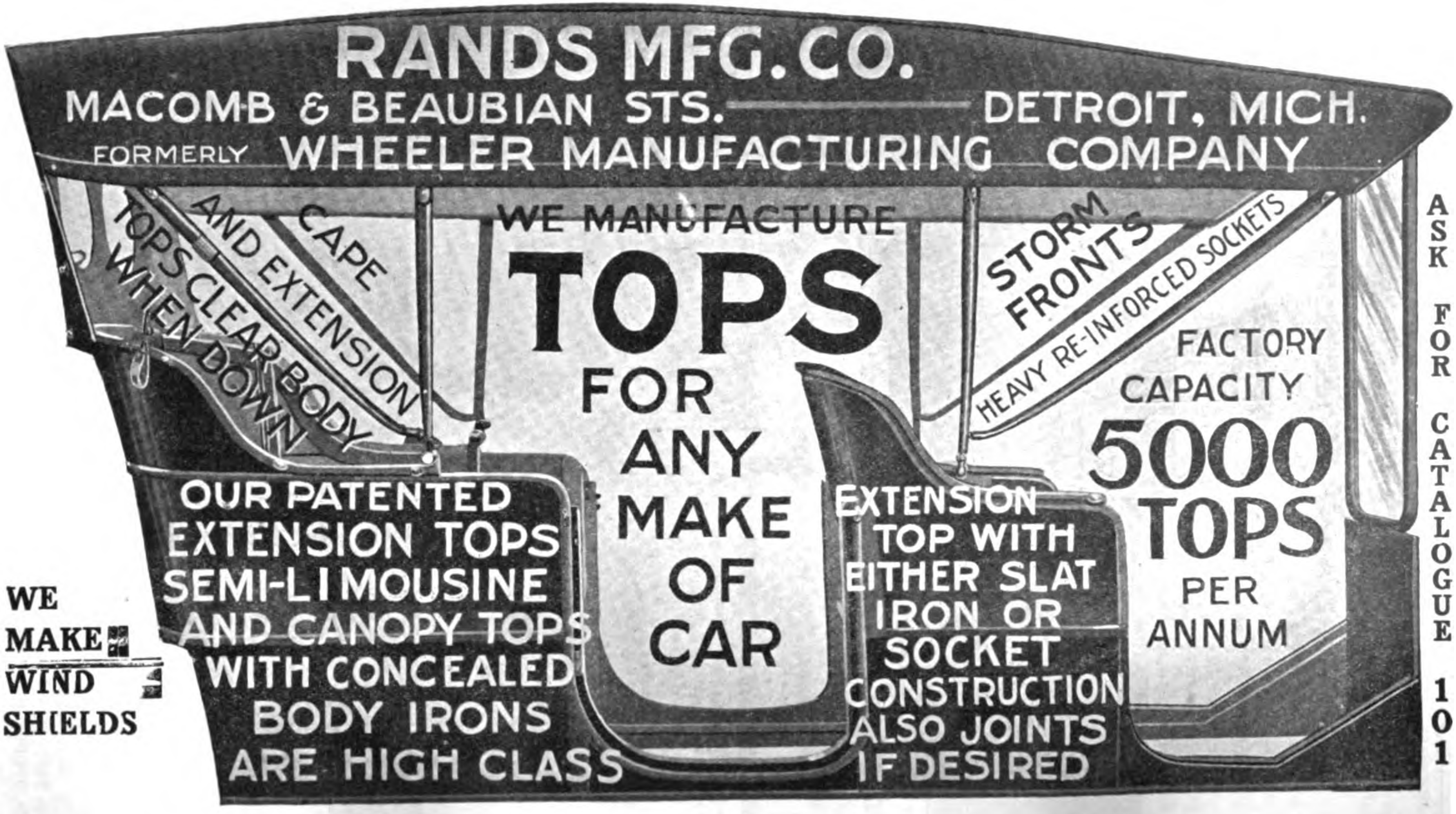
Heavy Type "Grant" Roller Bearing Steering Axle.

They are prepared to furnish complete bevel gear rear axles fitted with Grant or Standard roller bearings. On all classes of bevel gear construction, there is a very heavy end thrust, and their customers have found that the use of their ball thrust bearing on light work, and their plain roller thrust b ings for heavy work, overcomes this, and bearings show, after long use, no apprecia wear. They can supply the standard typ this axle of all sizes, or special designs wil made to order. They will furnish the c plete rear axle, or parts, as may be nee with or without the front axle.

They supply metal hubs of the reg artillery type, with sprockets or gears bo to the hub, for chain drive. These hubs fitted with Standard or Grant roller b ings, as may be desired. They will su gears or sprockets, or will fit them, when nished by customers.

They furnish ball bearing axles of sp design or after their own designs as des They find a large demand for ball bear especially in light construction and are pared to meet any requirement.

Formerly WHEELER MANUFACTURING COMPANY



RANDS MFG. CO.

MACOMB & BEAUBIAN STS. —— DETROIT, MICH.

FORMERLY WHEELER MANUFACTURING COMPANY

CAPE AND EXTENSION TOPS CLEAR BODY WHEN DOWN

WE MANUFACTURE TOPS FOR ANY MAKE OF CAR

STORM FRONTS

HEAVY RE-INFORCED SOCKETS

FACTORY CAPACITY 5000 TOPS PER ANNUM

OUR PATENTED EXTENSION TOPS SEMI-LIMOUSINE AND CANOPY TOPS WITH CONCEALED BODY IRONS ARE HIGH CLASS

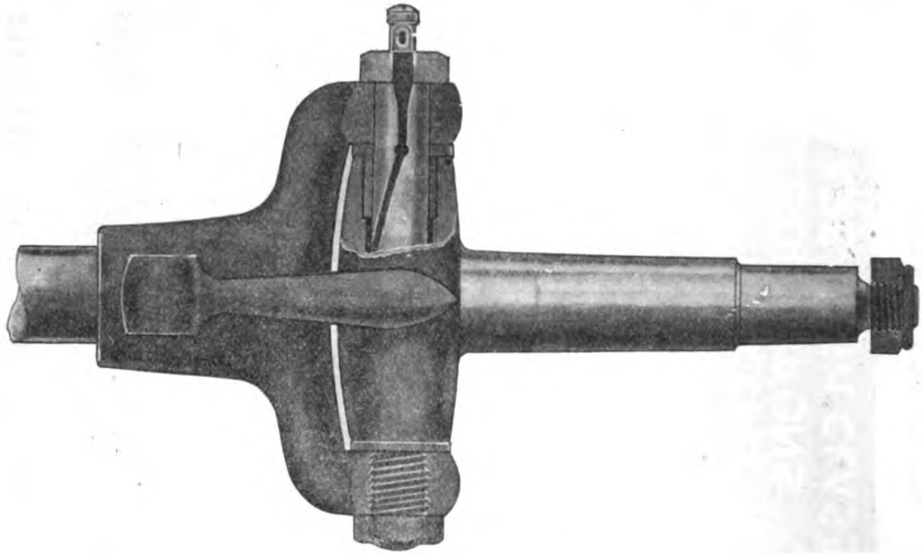
EXTENSION TOP WITH EITHER SLAT IRON OR SOCKET CONSTRUCTION ALSO JOINTS IF DESIRED

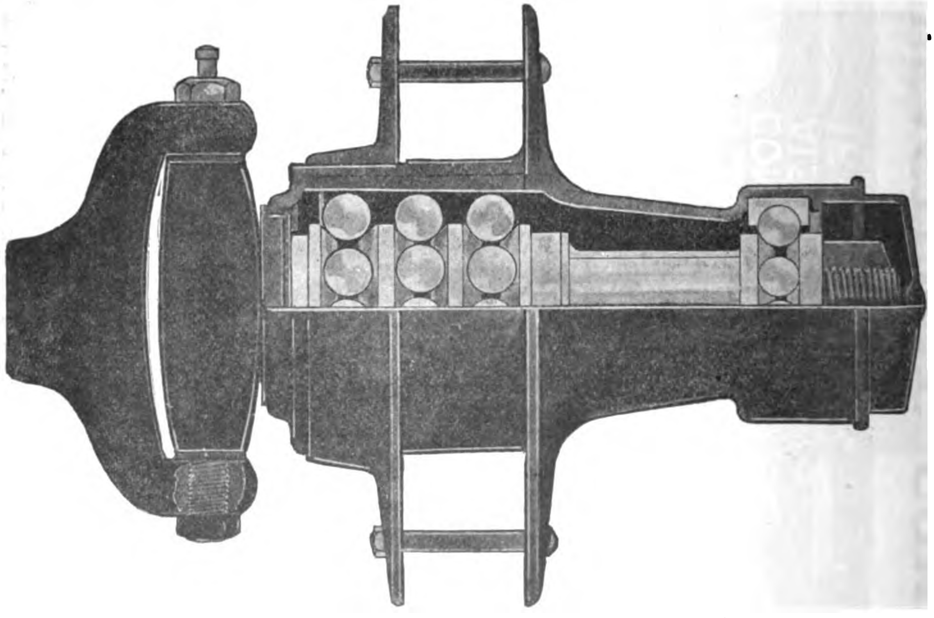
WE MAKE WIND SHIELDS

ASK FOR CATALOGUE 101

Formerly WHEELER MANUFACTURING COMPANY

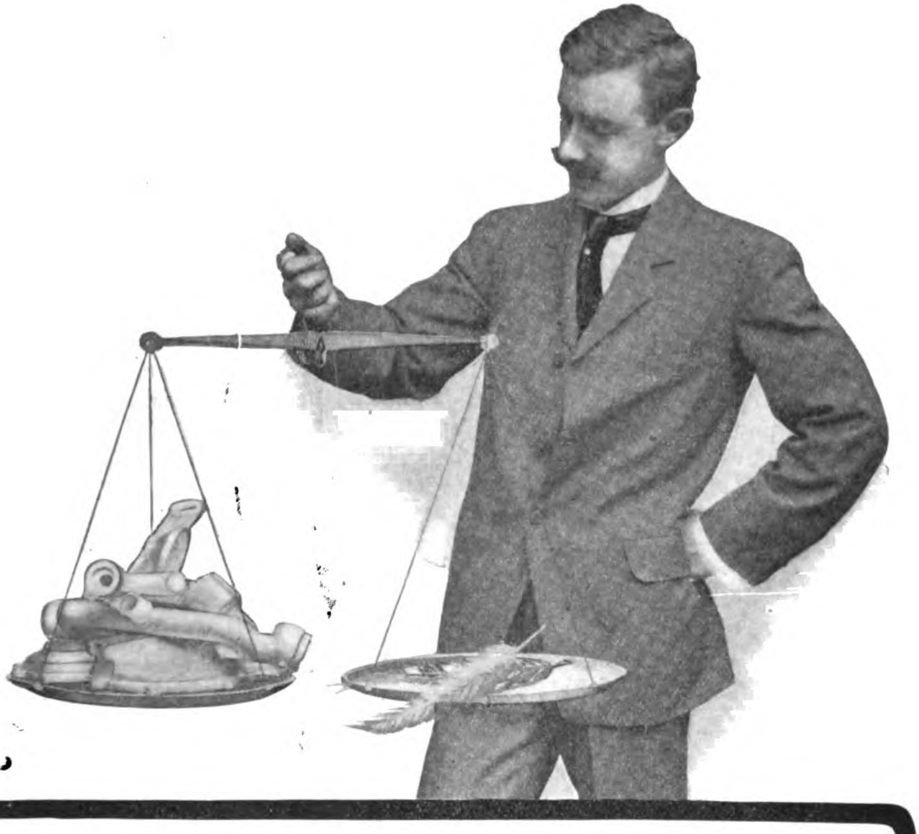
In addition to supplying steering knuckles complete, fitted with Standard or Grant Roller bearings, they are also prepared to furnish them machined and finished, but without bearings, and can furnish any size or form desired and will also finish knuckles and yokes sent by customers. They finish and thread the spindle machining and fitting the knuckle and yoke complete, with oil hole and bronze bushing and milling the yokes and supplying connecting bolts, nuts, etc., if desired.


"Standard" Plain Type Steering Knuckle and Yoke.


Ball Bearing Axle Fitted with "Standard" Ring or Annular Bearings.

Their plain roller thrust bearing consists of cylindrical rollers, held in a brass cage, and is said to be several times as strong as a ball thrust bearing of the same dimensions. It has proven especially desirable where there is a heavy pressure, and it effectually withstands shocks and sudden strains. While this bearing is not made right theoretically, it gives perfect satisfaction in practice. The rollers are very short, which compensate for any "slippage" which takes place. Each bearing consists of two hardened and ground steel washers and the roller bearing held in a self-contained cage. It is especiall desirable for use on bevel and worm gears.

F. A. Hinchcliffe, formerly assistant manager of The Winton Motor Carriage Co.' New York branch, has succeeded Harry Fosdick as manager of the Winton branch i Boston.



Strength and Lightness

are the two qualities desirable in aluminum castings, and are found to the highest degree in our

AUTOMOBILE BRAND CASTINGS

which are universally recognized as being superior to the product of any other foundry making aluminum castings for automobile purposes. They are used by many of the oldest and leading motor car makers, who have experimented with all kinds of castings, and for the sake of obtaining the best at the lowest market prices, use our **AUTOMOBILE BRAND** to the exclusion of all others. We have succeeded in producing the strongest and lightest aluminum castings made in America, and there are no patterns too intricate to prevent our making them satisfactorily.

We are also large producers of phosphor-bronze gear and phosphor-bronze bearing castings, especially adapted for automobile and motor boat construction. By correspondence you can obtain full information about prompt deliveries, right prices and best castings.

LIGHT MFG. & FOUNDRY CO.,
509 Queen Street, Pottstown, Pa.

WAY'S MUFFLER

PATENTED NOV. 16-30, 1897

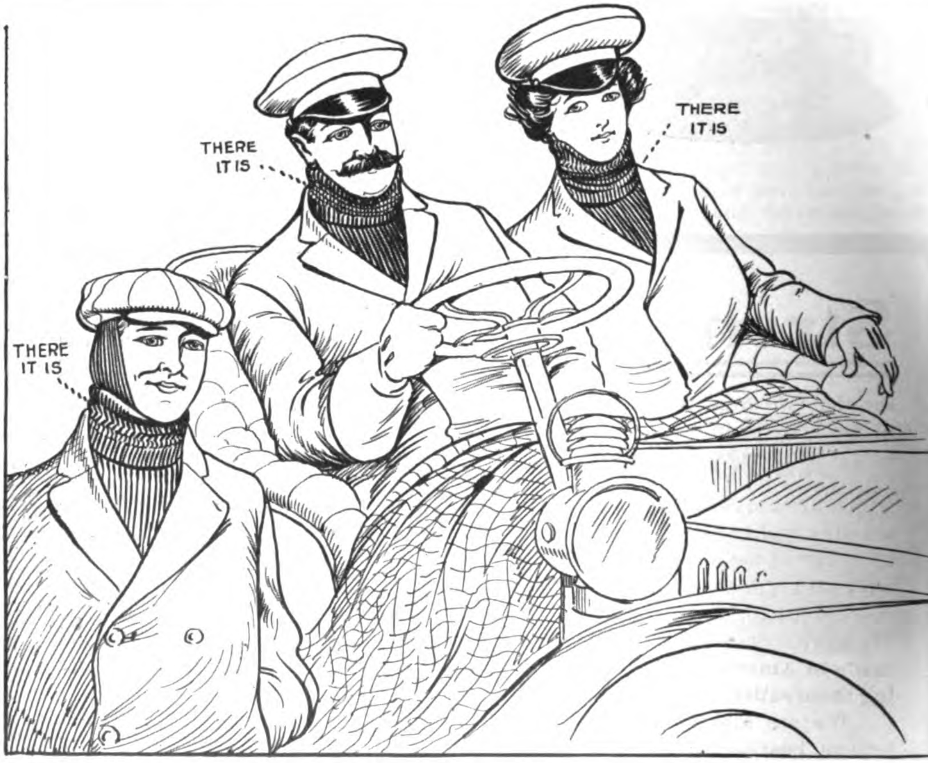
Throat and Chest Protector for Men, Women and Children for all out door pursuits

With or Without Ear Tabs

Don't go on over your head, but fastens with snap button back of neck. As eas and quickly put on and off as your hat.

When not needed, carry in your pocket to have it handy.

The Muffler designed especially for automobiling, is long enough to cover yo stomach as well as the chest and throat.



THE WAY MUFFLER COMPAN

J. HOWARD WAY, Proprietor **23d and Arch Streets, Philadelph**

NEW YORK, 43 Leonard Street
CHICAGO, 920 Medinah Temple
PITTSBURG, PA., 9th and Liberty Stre
CINCINNATI, 21 West 3d Street
LONDON, CANADA, Hiscox Building

WAY'S MUFFLER

PATENTED NOV. 16-30, 1897

THROAT AND CHEST PROTECTOR

WAY'S MUFFLER

2,600,000

Sold in America in 1904

Sold by all Dealers

At 25 Cents to $3.00

FOR MEN, WOMEN AND CHILDREN

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oprietor

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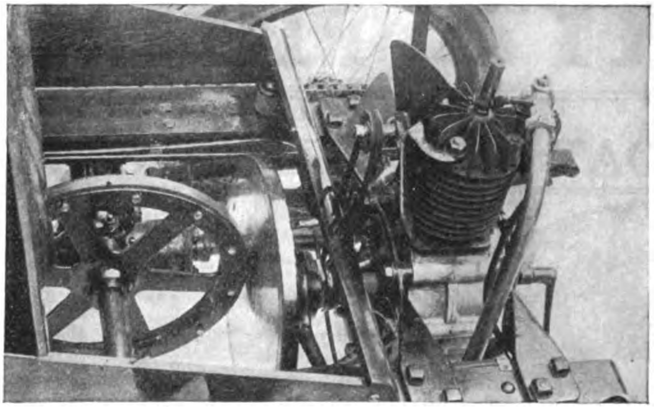
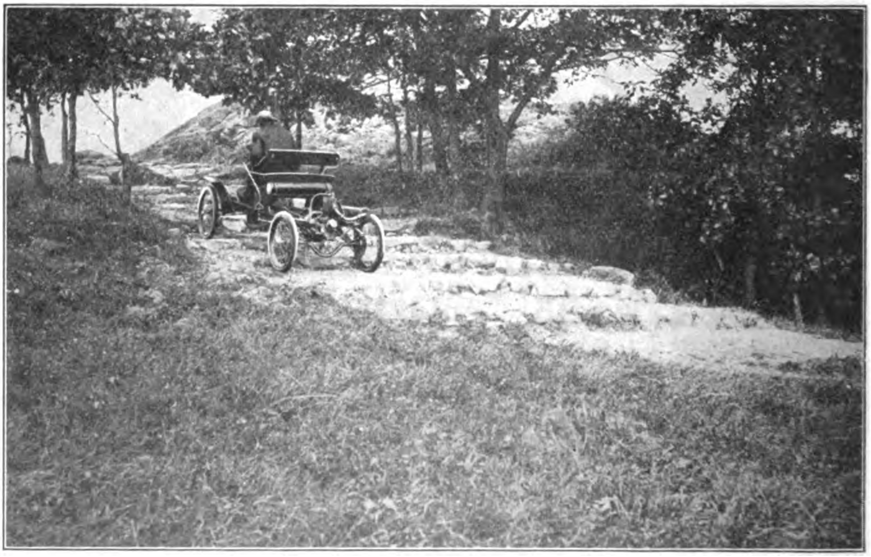
LONDON CANADA Hiscox Building



Power outfit and transmission of the 1906 Waltham-Orient Buckboard runabout. Complete vehicle was described and illustrated in the December number of the Journal, page 99. Transmission is by friction disks placed in front of the engine, which is located on the rear axle. A chain transmits motion to each rear wheel. Price of the car complete is $400; made by Waltham Mfg. Co., Waltham,

The Buffalo Electric Carriage Company, Buffalo, New York, has been succeeded by the Babcock Electric Carriage Company, which takes over the assets and good will of the Buffalo Company. The Babcock Electric Carriage Company has increased capital and anticipates putting out during 1906 not less than 500 electric vehicles. Their line will be along the same styles as those put out by the Buffalo Company, and two or three new models will be put out in time for the spring trade. The officers of the new company are:
F. A. Babcock, president and general ma
ger; F. L. Bapst, vice president; E. R. Wh
ney, secretary and treasurer.

Crucible Steel Forge Company, 58-60
Prospect Street, Cleveland, O., who put
a general line of forgings, are catering to
automobile trade with forged crank sha
and other forgings used in automobile
struction. They also make die forgings
sheet metal blanking work, tool steel ri
and shapes for die users and makers.



1906 Orient Friction Drive Buckboard climbing Prospect Hill near Waltham, Mass., where the manufacturers, Waltham Mfg. Co., are located. Prospect Hill is the highest point of land in or around Boston, 562 feet above sea level and the top is known as Old Boston Rock. The road is fairly good to within 200 feet of the top, where it ends abruptly. Ascent from this point is by means of a flight of stone steps by a rough and untravelled course, over stones and uneven ground. The grade to the stone steps varies from 5 to 22 per cent. and up the steps is 32 per cent. The climb was made, however, without the slightest difficulty and has been done repeatedly since. No automobile of any make, it is said, ever succeeded in getting beyond the end of the road. A pronounced feature of the new Buckboard is the absence of noise. Economically the Buckboard shows results that are remarkable, running 31 miles to a gallon of gasoline, and over 700 miles to a gallon of cylinder oil.

SCIENTIFIC CASTING

of Aluminum is an art acquired by experience. The quality of an Aluminum Casting is determined by its ***tensile strength, elastic limit, light weight*** and ***perfect workmanship.*** That our work is superior in these qualities is attested by the fact that we are furnishing annually upwards of ***four hundred tons*** of Aluminum, and large quantities of bearing bronze castings to manufacturers of the well known cars named below, most of whom buy exclusively from us.

Packard
White
Olds
Studebaker
Stearns
Premier
Wayne
Pierce
Columbia
Northern
Rainier
Franklin
Marion
Pungs-Finch
Cadillac
Royal
Welch
Cleveland
Woods
Moline
Jackson

We have ample facilities to meet required deliveries, and would be pleased to have you call at either of our plants or write for further particulars.

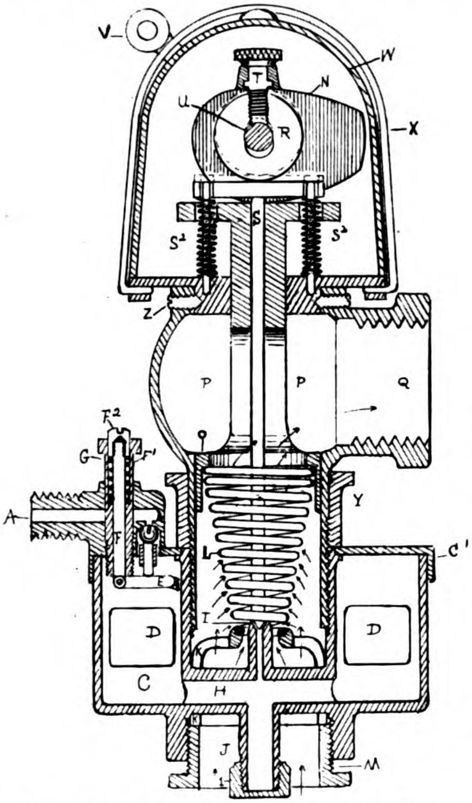
The Allyne Brass Foundry Company
Cleveland and Detroit
LARGEST PRODUCERS OF ALUMINUM CASTINGS in the UNITED STATES

Walker Adjustable Throttling Ratio Carburetor

B. F. Walker, of Bridgeport, Conn., has placed on the market a carburetor which he calls an "adjustable throttling ratio" carburetor, because of the fact that it can be adjusted to positively give any desired ratio of gasoline to air throughout the throttling movement. The sectional illustration herewith shows all the parts in detail, which are lettered to correspond with the descriptive matter following.

In operation the gasoline enters inlet (a), passes through ball valve (b) to float chamber (c), and is controlled by float (d), raising lever (e) bearing against stem of ball valve (b), fulcrumed at outer end to plunger (f), passing through and held flexibly against seat of hollow screw (g) by means of spring (f) and cap nut (f2). The hollow screw is for the purpose of adjusting height of float by raising or lowering the fulcrumed end of lever (e), the plunger also acting as a flusher.

The gasoline flows from float chamber (c) through passage (h) to spraying nozzle (i). The air enters through opening (j) at the bottom of carburetor, passing upward through spider (h) between coils of spring throttle (l), as indicated by arrows. The spring throttle (l) is supported by a spider (k), which rests upon and may be adjusted by hollow screw (m) at bottom of carburetor, for the amount of air admitted at low throttle.



Sectional View of Walker Adjustable Throttling Ratio Carburetor.

The throttling of air is accomplis
the action of cam (n) on the hollow
(o), depressing coiled spring. Owing
form of the spring, the larger coils
first, concentrates the air closer and c
the nozzle (i), producing a strong draft
same, thus thoroughly spraying the
which passes through a gauntlet of s
air into mixing chamber (p), and so be
thoroughly mixed and passes through
(q) into engine.

Cam (n) is divided, making two side
clamped between which is an eccen
which acts upon needle (s), yielding
ported on springs (s2) against ad
eccentric (r), which can be adjusted
tion to cam (n) by means of screw
may be set to give any desired am
gradual feed of gasoline to air through
throttling movement. The drawing
but one of the side walls of cam (n),
eccentric (r) with adjusting screw (t
plain outline of eccentric (r) shows th
set central, without throw. By raisin
indicated by dotted line, it will be se
it can be given any desired throw
the two extremes, throughout the th
movement, and being followed by the
(s) through action of springs (s2) give
responding opening to spraying no
The amount of gasoline desired at lo
tle may be obtained by screwing float
ber up or down, making more or les
between needle and its seat in nozzle.
ing through cam (n) and eccentric (
shaft (u) having a lever (v) at one
means of which cam and eccentric a
ated. (w) is a cover to protect the
ism from dust; (x) is a spring cla
holding cover in place; (y) a jam nut.

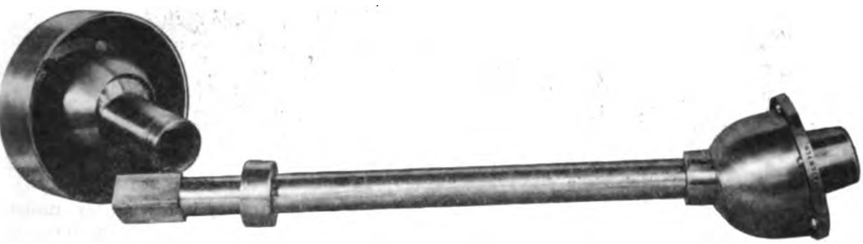
Walker Adjustable Throttling Ratio Carbur

Float chamber (c) is screwed on bo
carburetor body and retained in posi
jam nut (y), which also retains cover
any desired horizontal angle to body.
are retaining screws for top of carb
enabling the same to be placed at any
horizontal angle to the body. I is
cap.

The subscription price of the CYCLE &
MOBILE TRADE JOURNAL is $1.00 p
This includes 4 or 5 special numbers w
worth 50c. each, in addition to the regular
You will therefore receive $4 or $5 value f
Subscription blank will be found on page 44

SPICER

UNIVERSAL JOINTS



DURING the past season the **SPICER UNIVERSAL JOINTS** have given the best of satisfaction. We have made some minor improvements for this year, and they are now better than ever.

We have fifty-one different sizes and models, one or more f which should meet your requirements. They are fully escribed in our catalog, which will be sent upon request.

These joints are thoroughly well made and dependable, nd are absolutely oil-tight and dust-proof. They are in a lass by themselves, and our aim is to make **in every way he best joint on the market**.

Our new equipment increases our capacity about 600 per ent. and consists of the latest up-to-date machines, more than alf of which are individual electric motor driven.

Material and Workmanship are Fully Guaranteed

Place your order at once, to insure prompt delivery.

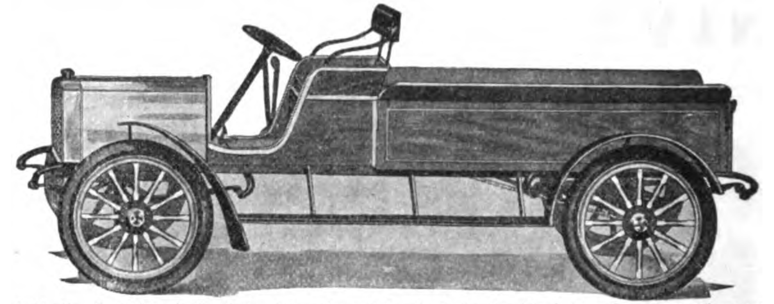
SPICER UNIVERSAL JOINT MFG. CO.

PLAINFIELD, N. J.

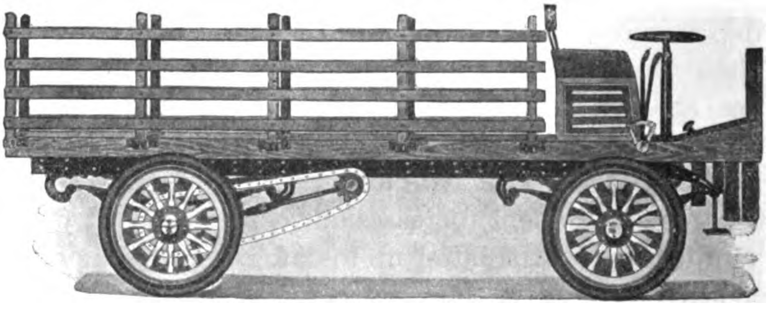
Factory Representatives:
K. FRANKLIN PETERSON, 166 Lake Street, Chicago, Ill.
THOS. J. WETZEL, 11 Warren Street, N. Y. City.

Neustadt 1906 Commercial Vehicle Outfits

Neustadt Automobile and Supply Co., 826-830 South 18th street, St. Louis, Mo., are offering several distinct types of commercial car outfits for 1906, and are making a special drive on these, the demand for commercial vehicles being very large and the future prospects very bright. The indications are for a very good season in commercial vehicles. Of course, the Neustadt people make a specialty of furnishing the outfits, including every necessary part, but do not care to assemble the same, preferring to deal only in the outfits and let purchasers do their own assembling. Our illustrations show a number of Neustadt outfits assembled, and besides these they offer several stock outfits which with the ones shown meet nearly every requirement, but they can also meet any special requirement not covered by any of their stock outfits. Some of the outfits shown can by slight change be made to suit other businesses than those for which they are particularly fitted. For example, the No. 1 outfit was constructed for a brick maker, for carrying a very heavy load of bricks, and in this case it is necessary to put in a powerful 4-cylinder engine. Now, if it were wanted exactly the same appearance, but for less carrying capacity, a smaller engine suitable for the work proposed could be used, smaller and less expensive tires, and a general lightening up of the axles and other parts affected to avoid excessive weight where the carrying capacity would not be so great. In their No. 2 rig an idea is conveyed as to the carrying capacity of the chassis, but the body could be changed to suit any customer's requi ments and the same thing applies on eve rig shown.



Neustadt No. 2 outfit, single chain drive; bonnet front, body furnished to suit any requirements.



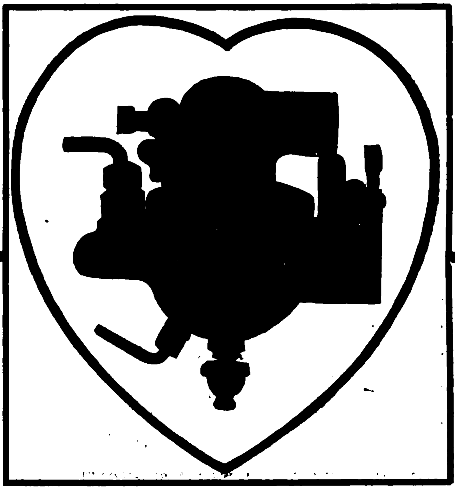
Neustadt No. 3 outfit, double chain drive. Same chassis as No. 1, particulars of which are given in the text. Neustadt Automobile and Supply Co. furnish complete commercial vehicle outfits, unassembled, including power, to suit every known requirement of business houses, baggage and passenger transfer companies, etc.

No. 1, a flat platform truck, is made any dimensions. Double chain drive is e ployed, all wheels running loose on rol bearings. The size of the axles is, of cour variable to correspond to the general dim sions of the vehicle. It can be fitted with 22 H. P. 2-cylinder opposed engine in cent of chassis or a 4-cylinder motor under t seat. In the former case chain drive is e ployed throughout, from engine to count shaft and from countershaft end sprock to rear wheels; but in the latter case a co bination of bevel gear, chain and sprock drive is installed. For light work 2½ 3 inch solid, internal wire tires are us but where heavy work is required Fisk inch flat tread tires are fitted. The platfo can be furnished, as shown, of any desi dimensions or different bodies can be f nished.

The body can be made exactly as shov subject to variation in size or a differe design if needed for specific purposes.

Exact specifications cannot be given in general review of the line, as the parts va according to the class of vehicle. For stance, the ordinary disc tube radiator of tubes would be used with the opposed cyl der for a light rig and one of much larg capacity for the multiple cylinder engi Their No. 2 rig being of cheap constructio is designed for the use of an opposed cylind motor only, and can be made with eith pneumatic tires or solids of any size or ki that may be specified. It is of single cha drive and the same remarks about capac

THE HEART OF THE AUTOMOBILE



The Schebler Carbureter

STANDARD OF THE WORLD

¶ 1,094 3-16 miles in twenty-four hours continuous running on a circular track; 1,000 miles in 21:58:00 4-5 continuous running on a circular track, breaking all world's records by 1:35:19 1-5.

¶ This is the world's record travels of a National car fitted with a SCHEBLER carbureter at the Indianapolis Fair Ground Tracks, Nov. 16th and 17th. Hundreds of miles were reeled off with scarcely a variation of a second in the time of each.

¶ Is it any wonder that eighty-three of the largest marine and automobile engine builders in the United States and Canada are equipping their motors with the SCHEBLER?

¶ A carbureter that gives a perfect mixture at all engine speeds regardless of weather conditions is truly "The Heart of the Automobile."

WHEELER & SCHEBLER, Manufacturers Indianapolis, Ind., U. S. A.

P. J. DASEY, 431 Wabash Ave., Chicago, Ill., Factory Representative

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CONSOLIDATED SUPPLY CO., Denver, Colorado
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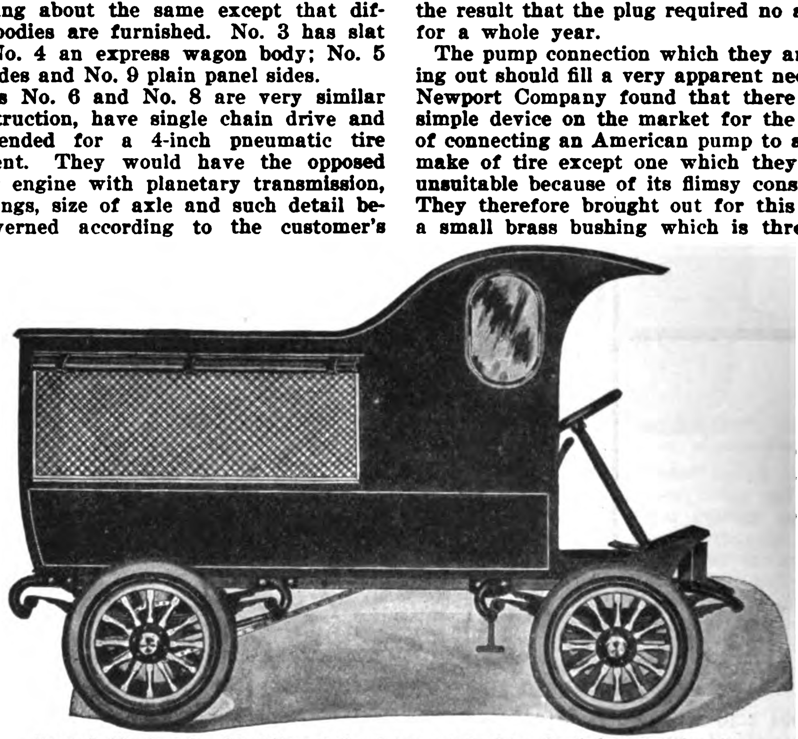
LOS ANGELES AUTO CO., Los Angeles, Cal.
McCULLOCK & BOSWELL, Winnipeg, Manitoba
WILSON & COMPANY, Ottawa, Ontario, Can.
CANADA CYCLE & MOTOR CO., Toronto Junction, Can.
SHUMAN CARRIAGE CO., Honolulu, T. H.
TURNBULL & JONES, Dunedin, N. Z.
GEO. NEILL & CO., 38 Fenchurch St., London, England

apply as in the first instance.

Nos. 3, 4, 5 and 9 have the same chassis construction as the No. 1 and the same variations and options apply also; the construction being about the same except that different bodies are furnished. No. 3 has slat sides; No. 4 an express wagon body; No. 5 stake sides and No. 9 plain panel sides.

Outfits No. 6 and No. 8 are very similar in construction, have single chain drive and are intended for a 4-inch pneumatic tire equipment. They would have the opposed cylinder engine with planetary transmission, the springs, size of axle and such detail being governed according to the customer's specifications or information as to load, and the road conditions.



Neustadt No. 8 outfit with delivery body Single chain drive, 2-cylinder opposed motor.

Rig No. 7, a passenger 'bus, is designed for 12 people and the driver. The chassis construction is very similar to the commercial rigs except that pneumatic tires are used, on account of their easier riding qualities. This vehicle can be extended to accommodate 16 passengers, in which case a four cylinder motor would have to be substituted or if wanted for a transfer 'bus in a country town where no more than 6 or 8 people are ever carried at any time, the rig could be shortened, proportionately less power used, the total cost being thus lessened.

Newport Plug Protector and Pump Connection

Newport Engineering Works, Newport, R. I., have recently placed on the market two simple devices of great merit and usefulness. One is a simply constructed spark plug protector which has proved very successful. It is a cast iron bushing of hexagonal form which screws into the cylinder and is interiorly threaded at its outer end to admit the spark plug. A small hole about ⅛ in. in diameter is drilled through the inner end. This hole, while allowing gases to come in contact with the sparking points and also allowing the spark to be communicated to the charge in the compression chamber, perfectly protects the sparking points from e and soot. The Newport Company advises t that some of their customers have used th device in conjunction with a mica plug, wi the result that the plug required no attenti for a whole year.

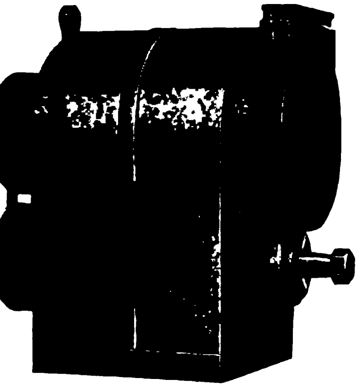
The pump connection which they are brin ing out should fill a very apparent need. T Newport Company found that there was simple device on the market for the purpo of connecting an American pump to a forei make of tire except one which they deem unsuitable because of its flimsy constructio They therefore brought out for this purpo a small brass bushing which is threaded one end to fit American pumps and valv and at the other end to fit the foreign pum and valves. By having this bushing, whi is very small, only about ¾ in. long, it is po sible to use on the same machine both forei and American tubes if necessary, and still able at all times to connect an Americ pump to the same. The outer circumferen is knurled, so that it can be easily screw home.

The E. J. Willis Co., New York, have r cently taken a ten-year lease on a four-sto building at 231 W. 54th street, where th will establish an up-to-date branch. The l cation is favorable, being but a few doo from the A. C. A.'s new club house, a convenient to many of the largest garag $15,000 is being spent in refitting the pro erty.

Thos. Prosser & Sons, of 15 Gold Stre New York, are selling to the American tra special steel for motor car construction, pr duced at the Krupp Steel Works in Germar This steel is put out in a number of differe grades, each specially adapted to use in so particular part of the car. The material h been subjected to every possible test to pro its efficiency for the uses to which it is pu A handsome and thorough catalog has be issued by the Prosser Company, which go into the subject very much in detail.

HOLLEY
MAGNETO

HUFF SYSTEM



Is far superior
to any device manufactured in this Country or Europe. Its chief advantages are:

A single coil
with vibrator can be used in connection with both magneto and batteries.

A secondary
not being on the armature, does away absolutely with the liability of breaking down.

It will give a
longer and hotter spark than any machine made; ⅜" spark at 50 r. p. m., 50" at 900 r. p. m.

The system
is such, that it tends to build up the magnets. We guarantee them to be stronger after six months' use than when new.

Price of magneto,
coil and condenser is $135.00.

Circular "HM" sent on request

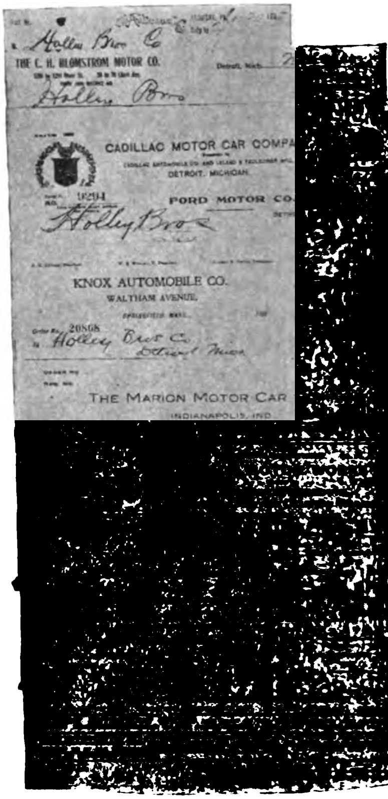
Holley Bros. Co.

668 Beaubien St., Detroit, Michigan

HOLLEY CARBURETORS

are used by the largest automobile manufacturers in America. They tested all makes, that is why they use the Holley.

You can save the expense of experimenting by following the lead of the leaders.



Holley Bros Co

THE C. H. BLOMSTROM MOTOR CO.

Detroit, Mich.

Holley Bros

CADILLAC MOTOR CAR COMPA

DETROIT, MICHIGAN.

No. 9294

FORD MOTOR CO.

Holley Bros

KNOX AUTOMOBILE CO.

WALTHAM AVENUE.

Order No. 20868

Holley Bros Co

Detroit Mich

THE MARION MOTOR CAR

INDIANAPOLIS, IND

HOLLEY CARBURETORS

Will be used on the 1906 output of the following firms:

The Autocar Co., Ardmore, Pa.
Blomstrom Motor Co., Detroit, Mich,
Cadillac Motor Car Co. (four cylinder), Detroit, Mich.
Ford Motor Co., Detroit, Mich.
Knox Automobile Co. (four cylinder), Springfield, Mass.
Marion Motor Car Co., Indianapolis, Ind.
Mitchell Motor Car Co., Racine, Wis.
The Nordyke & Marmon Co., Indianapolis, Ind.
Olds Motor Works, Lansing, Mich.
E. R. Thomas Motor Co., Buffalo, N. Y.
Wayne Automobile Co., Detroit, Mich.
Winton Motor Carriage Co., Cleveland, O.
Welch Motor Car Co, Pontiac, Mich.

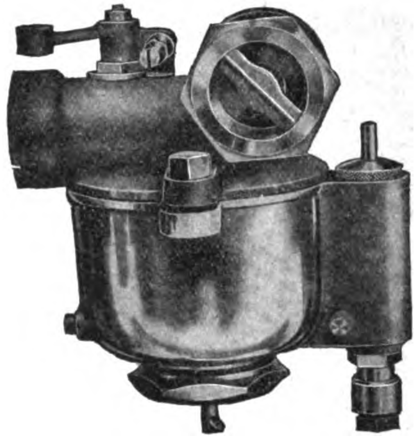
CIRCULAR "A" SENT ON REQUEST

Holley Bros. Co.

668 Beaubien St., Detroit, Michigan

Buy carburetors designed especially for your automobile, not those made for all motor cars and suitable for none.

HOLLEY



arburetors

e used (in nearly every instance) by the manufacturers of the cars ey are advertised to fit. Can our competitors make this assertion? low will be found a list of carburetors especially designed to meet e requirements of the cars mentioned. Our latest special carbu- tors are one for the Orient Buckboard and one for motor cycles. ice, $11.00 each. We also have a heater attachment ready to be aced on Ford "F" cars. It will greatly increase the efficiency dur- g cold weather. Price, $3.00.

FORM "A"

1902, '03 or '04 Oldsmobile Runabout	$12.00
1904 two cylinder Ford	11.00
Olds single cylinder Tonneau	11.50
Olds Touring Runabout	11.50

MODEL "E"

1905 Winton models B and C	$18.00
Single cylinder Cadillac	13.50
Orient Buckboard	11.00
Two cylinder Northern	14.00
" " Buick	14.00
Single cylinder 8 H. P. Crest	13.00
10 and 12 H. P. four cylinder Franklin	12.00
Two cylinder Queen Car	13.00
Single cylinder Northern	12.00

Circular "A" sent on request

IOLLEY BROS. CO.

668 BEAUBIEN ST.
DETROIT, MICH.

Wanted, Hustler

WE WANT AGENTS in all parts of the country to push the sale of Holley Carburetors

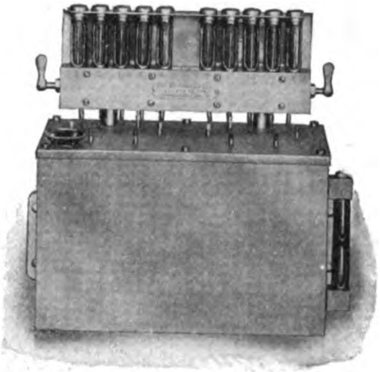
We are looking especially for young men, who have had practical experience with carburetors and can visit the trade and also the consumer in their locality. Any honest man, with ordinary business ability and some practical experience with carburetors, can establish an excellent trade, by handling our carburetor with several other automobile specialties, which do not conflict. If you are the right man write us for further information and give us particulars.

Circular "A" sent on request.

HOLLEY BROS. CO. 668 BEAUBIEN
DETROIT, MIC

Hill Precision Oilers

Reduce the Cost of Up-Keep



OIL is fed in **adjustable measured** quantity to **each** bearing. Thereore there is no waste of oil, but instead, ach bearing all the while gets all the il it needs.

This oiler feeds **only** when the ngine is in motion. That also prevents vaste.

Oil is fed at **regular intervals,** in roportion to the speed of the motor, o that the bearings are **never** flooded and **never** starved but are **always** ufficiently fed.

The operating mechanism of these oilers is composed of fewer parts han any other mechanical oiler employs, and in each oiler, the working arts are ground to a perfect oil-tight seat in the particular tank in which hey are placed, insuring perfect and permanent alignment, preventing wear, nd insuring as perfect service after long continued use, as when first nade.

There are no valves to clog and get out of order.

Oil is **not** fed by gravity nor by air pressure, but by **mechanical orce.** Clogged tubes can stop gravity-fed oil before it ever gets to the earings. And air pressure can leak so that the oil stands idle in the ubes. But Hill Precision Oilers exert mechanical pressure so powerful that ven in the most frigid weather lubricating **oil cannot stop** in the tubes, ut **must reach the bearings** and there **prevent** friction and wear. These ilers positively **shoot** oil to the bearings with the force of a catapult and he accuracy of mathematics. That means money saved to you.

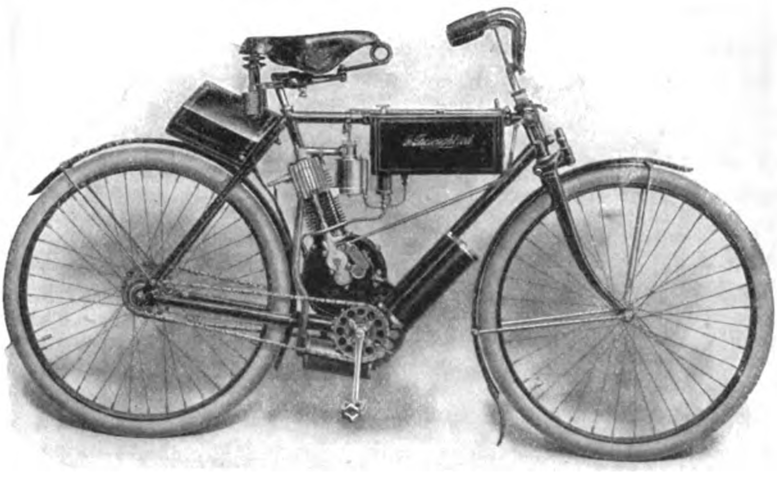
The Steel Ball Company

Nos. 832-840 Austin Ave., Chicago, U. S. A.

Illustrated Catalogue Free upon Request.

The 1906 Thoroughbred Motor Cycle.

Quite a number of improvements in detail are comprised in the 1906 Thoroughbred Motor Cycle, put out by Reading Standard Cycle Mfg. Co., Reading, Pa., and in general appearance it differs considerably from the 1905 model. The gasoline and oil tank is placed in the diamond of the frame instead of over the rear mud guard, and in this new placing of the tank it seems that a gain has been made in protecting the same from knocks. This position also allows of making the tank more substantial and makes it a factor in steadying the machine, as it helps to lower the centre of gravity. The oil compartment of the tank is fitted with a device which is operated from the seat and forces oil into the cylinder, permitting the rider to oil the motor without dismounting.



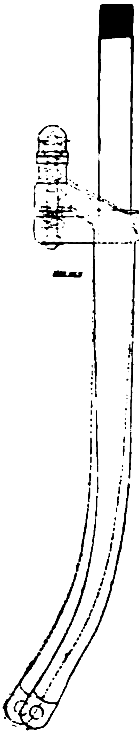
The 1906 Thoroughbred Motor Cycle.

The projectile-shaped battery case formerly attached to the lower tube has been dispensed with and a different shaped case holding 3 cells is now attached at the rear. A new saddle of English make is used, and it is likely that a spring seat post will be adopted.

One of the most important improvements is the new cushion fork which has been thoroughly tested during the past season. It consists of few parts and has only 3 brazed joints. The Reading people claim for this fork not only ample resiliency but plenty of strength, and these are the two important essentials in a spring fork. The guard attached to the fork extends over the top of the wheel and is supported by braces front and rear.

The top and bottom bars of the frame in the 1906 model are heavily reinforced and a one-piece head is used. The rear forks and stays are altered to accommodate a 2¼-inch rear tire, which is fitted to the 1906 machine. The chain line is widened from 1¾ to 1 15-16 inches, giving more room between the engine base and side of chain, and therefore providing space for a longer bearing in the engine base for the crank shaft.

A coaster brake ⅜ inch wider over all used and ¼ inch wider between flanges. T cylinder bore and stroke have been increas to 2⅝ and 3¼ inches respectively, there increasing the power of the motor consid ably. The Thor motor which is used on t Thoroughbred has also been improved other features. The carburetor stem h been altered so that it is no longer necess to connect the same to the upper bar. T carburetor has also been improved interna causing it to give a better mixture. A n cam lifting arrangement has been devis which is oil tight and gives a roller contac



Spring fork of the 1906 Thoroughbred Motor Cycle.

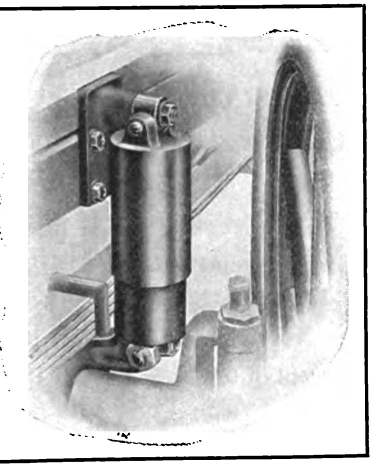
The Thoroughbred "Tri-car" is built w a side wheel attachment, and is furnish with a comfortable cane seat or can be f nished with a combination seat and delive can, or with a delivery can only.

This tri-car weighs complete with cane s about 185 lbs. Its carrying capacity is 5 lbs., and its speed from five to twenty mi per hour. A feature of this car is that t track can be adjusted from 44-inch to f width of track.

The principal advantage of this car is th it can be easily detached, converting t machine into the ordinary motor cycle. T simplicity of this attaching or detaching t car from the motor cycle is quite a featu and a great convenience to the owner, as requires only a few minutes to make t change. In this machine the operator's vi in front is not obstructed, the operator a companion sit side by side and conversati is not difficult. The building of a fore-car also in contemplation.

Kilgore Automobile Air Cushion "SHOCK-ELIMINATORS"

Patent Allowed



ON GOOD ROADS

NO RESTRAINT on the natural elasticity of the springs.

ON BAD ROADS

By controlling AUTOMATICALLY the too violent spring play.

By taking the EXTRA LOAD and STRAIN from the springs. The tires, springs, axles, machinery and PASSENGERS ARE PROTECTED FROM DAMAGE and DISCOMFORT.

NO ADJUSTMENT EVER NECESSARY—A device may be n 5000 miles without adjustment, when it actually needs it every fty miles. The Kilgore does **not even need** adjusting.

No clinging to the seats for dear life when Kilgore Cushions re used.

Read This—We Have Many Similar Ones:

Copley Square, Boston, Mass., December 1st, 1905

Gentlemen:—Regarding the set of Kilgore Auto. Air Cushion—"Shock-Eliminators" aced on my Thomas Limousine last April, allow me to convey to you my gratification d satisfaction.

They have stopped the terrible rebounding of the rear and have made riding a pleas- e even with **the solid tire equipment.**

I trust that the Boston Automobilists will soon learn their true value in the attain- ent of the greatest comfort possible, whether upon country roads or upon the City bble-stone paving.

Very sincerely,
FRANK LEROY PURDY, M. D. D. O.

ILGORE "SHOCK-ELIMINATORS" The Best Selling Sundry for 1906. Dealers Should Get in Line Early

---

ilgore Automobile Air Cushion Co.

No. 48 COLUMBUS AVE., BOSTON, MASS.

HARRIS OIL

Agents Wanted Everywhere!

WE want distributing points for **Harris Oils,** and will make liber arrangements with automobile dealers who represent us. Here a proposition which will enable you to add a good profitable featu to your business. We are pushing the sale of the best oils and lubricants th can be made, and our representatives will get the benefit of this push.

The shipment of oil in small quantities all over the United Stat is a difficult task. It is more satisfactory to have agents who can hand local trade for us. We can show you how it is possible for you to wo up a good trade with **Harris Oils.** We are large advertisers, and crea a demand. The first good applicant in each locality, not already assigne will be alloted the agency. Better apply at once—it's an unusual oppo tunity. Our line of lubricants embraces everything required for the prop lubrication of all parts and all kinds of motor vehicles will be exhibit at both New York Shows—Chicago and Boston.

A. W. HARRIS OIL CO.

333 S. Water St., Providence, R. I.

HARRIS OIL

FOR AUTOMOBILE

HARRIS OIL

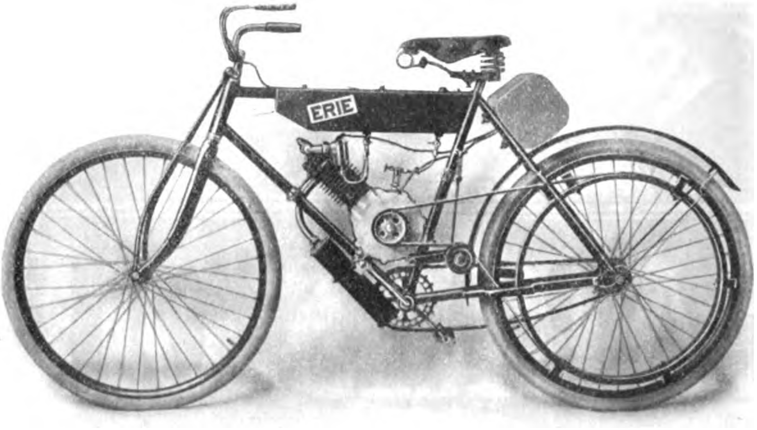
LUBRICATION

DEALERS—TAKE NOTICE!

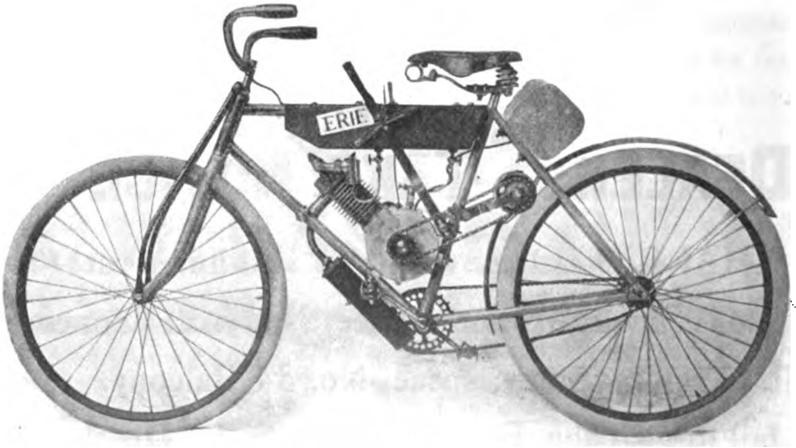
HARRIS OILS will be exhibited at the Madison Square Show, space No. 180 Concert Hall, Armory Show, space No. 34 Balcony. Do not fail to visit the Exhibit and **"see the Oil flow"** and make your arrangements for 1906.

A. W. HARRIS OIL CO. 333 S. WATER ST. PROVIDENCE, R. I.

1906 Improvements of the Erie Motorcycle



The 1906 Erie Belt Driven Motorcycle.

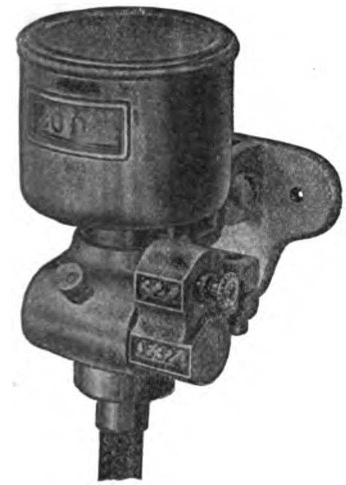


The 1906 Erie Friction Driven Motorcycle.

The Motorcycle Equipment and Supply Co., 934 Main street, Buffalo, N. Y., besides improving their motor cycle power outfits, are this year offering complete motorcycles, both belt and friction driven. The power of the motor has been increased from 1¾ to 2 H. P., and it is fitted with a new bearing composed of a special hardened tool steel sleeve forced over the crank shaft and running in phosphor bronze bushings in the crank case. The main bearings are 1 3-16 in. long. Engine is 25 lbs. weight, and is 15½ in. high. Crank shaft is ¾ in. diameter. A standard size battery and steel battery box is used. Goodrich 1¾ in. tires are fitted. The tank is attached to the top tube. The friction drive consists of a chain driven friction roller resting on the rear wheel, which can be attached to a bicycle without altering the frame. This model develops a speed of from 1 to 32 miles per hour, while the belt driven machine develops speeds up to 32 miles per hour. Th spark advance lever is situated on the to of the tank and the grip switch on the lef handle bar. The sight feed oiling devic holds enough oil for 150 miles running instea of 100 miles as in the old outfit. The equip ment includes a Mesinger saddle and a trus fork. These machines have 50 in. whee bases, 22 in. frames and weigh 85 pound each.

The Erie 1906 Power Outfit for convertin an ordinary bicycle into a motorcycle is th same as is used on the regular motorcycl and will fit any size of frame from 21 to 2 inches. A special size of tank is made fo 20 in. frames.

By the use of the free wheel transmissio the engine can be stopped or started indepen dent of the machine, and the engine can b free and left running if going through crowded thoroughfare. The motor can b tested without propping up the rear whee and the motorcycle can be started the same a a bicycle without the engine running.



Start the New Year Right

with

The AUTO-METER

on your dashboard.

"It Tells How Fast"
"It Tells How Far"

If you want to know with absolute certainty just what your car is doing in the way of speed at any time, the Auto-Meter's Speed Dial will tell you.

If you want to know with absolute certainty just how far your car has traveled on a trip, the Auto-Meter's Trip Dial will inform you.

If you want to know with absolute certainty just how far your car has traveled after the season is over, the Auto-Meter's Season Dial will show you.

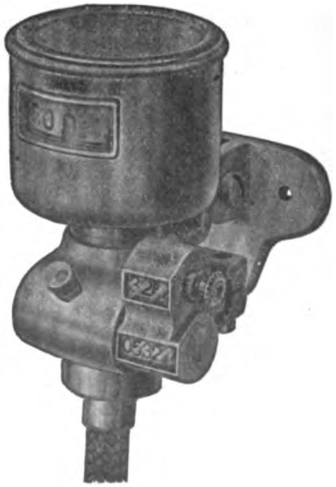
Automobiling is not enjoyed to the fullest, until there's an Auto-Meter on the car.

Write for Catalogue and
"Indisputable Evidence."

Warner Instrument Co.

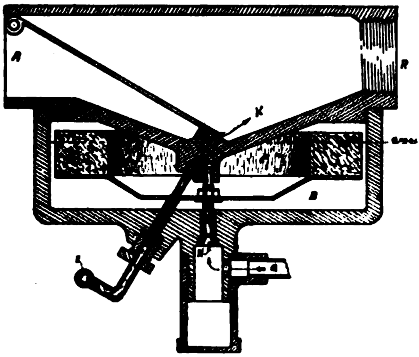
51 Roosevelt Avenue
BELOIT - - WISCONSIN

NEW YORK OFFICE: 1691 Broadway
BOSTON OFFICE: 143 Federal Street
CHICAGO OFFICE: 804 Steinway Hall
NORTHERN CALIFORNIA: G. P. Moore & Co., San Francisco
SOUTHERN CALIFORNIA: Heineman & Pearson, Los Angeles



Fouch Automatic Carbureter

J. R. Fouch Carburetor Co., 35 Chute Block, Minneapolis, Minn., are marketing an automatic carburetor, sectional view of which we show herewith, this view giving a very excellent idea of the construction and operation of the carburetor in connection with the following description: On the drawing "F" represents a circular float rigidly connected to shut off valve "R," maintaining a constant level of gasoline in float chamber "B" at dotted line marked "Gasoline Level." Needle valve "E," controlling the gasoline flow to mixing chamber, is the only adjustment to be made. "K" is a door valve which, by aid of a balanced spring not shown, maintains a constant pressure on air entering the carburetor at the nozzle point "D," thereby maintaining a constant suction on gasoline nozzle, no matter what the speed or volume of passing air. A motor fitted with one of these carburetors, it is claimed, has never failed to start on the first compression, and works on the throttle like a steam engine, quick to pick up the load. For a centre float an advantage claimed is the producing of a perfect mixture on hills, or on side hills. The small float chamber and centre feed of nozzle prevents slopping of the gasoline into the mixing chamber.



Sectional View of the Fouch Automatic Carburetor.

The Auto. Improvement Co., 304 Hudson street, New York City, are bringing out a device called a "Detector," which is a clock arrangement that enables the owner to know whether his automobile has been used during his absence. Another article just put out by them is the improved gasoline-filler, which deos away with the necessity of carrying a funnel to fill the gasoline tank and also has a gauge to indicate the amount of gasoline in the tank.

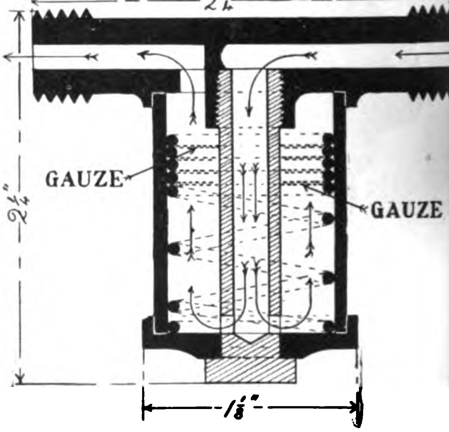
American Die and Tool Co., Reading, Pa., put out a line of high speed milling cutters, drills, counter bores, reamers, etc., made of the best steel for the purpose. Their milling cutters are accurately made and nicely finished, perfectly hardened and tempered. They also make a number of automobile parts, including engines, axles, gears, crank shafts, transmission shafts, etc.

On page 444 you will find subscription blank of the CYCLE & AUTOMOBILE TRADE JOURNAL. You cannot afford to miss a single issue. Fill out the blank and mail it at once, with $1.00.

The 1906 "Breeze" Fuel Straine

Breeze Motor Mfg. Co., 33 Court str
Newark, N. J., have made quite some cha
in the construction of their fuel strainer
1906, as shown by the accompanying s
tional cut.

The gasoline goes in on one side, follo
the direction of the arrows, down the cen
tube, out into the body of the strainer wh
forms a large dirt or water trap, then filt



"Breeze" 1906 Gasoline Strainer.

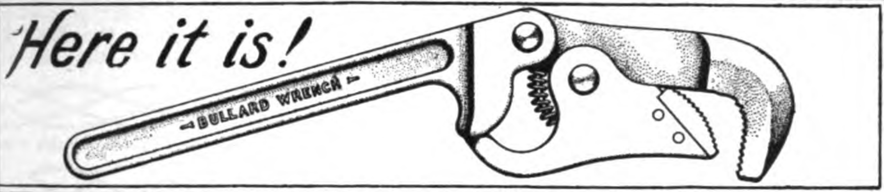
upwards through the four gauze strain
which are held in position by a spring, a
goes out on the opposite side positively cle

To clean the strainer it is only necessa
to unscrew the centre tube which ends in
hexagon nut at the bottom and everythi
comes apart. This strainer is furnished w
⅛ or ¼ in. pipe threads and lists at $1.

The Atlantic Leather Co., Newark, N.
make a specialty of automobile trimmi
leather, which is furnished in all finishes a
colors in the hand buff, machine buff, de
buff and split grades. These leathers a
largely used by the automobile trade, by bo
foreign and domestic car manufacturers.

Breeze & Lawrance, 5 W. 16th Street, N
York, are putting out an aluminum alloy f
automobile castings which they call "alum
oid." It has a high elastic limit and 250
lbs. tensile strength. It is less than half
heavy as cast iron, about one-third the weig
of brass and of much less specific gravi
It holds threads well and machines nicely

The Semi-Dry Battery Co., 73 Hamilt
Street, Newark, N. J., advise us of a slig
inaccuracy in our description of their "Du
Semi-Dry" ignition cell in our November nu
ber, page 162, in which it was stated that "b
tween periods of use this cell will recupera
to within a small margin of its original e
ciency." The word "previous" better e
presses the idea intended to be conveyed th
the word "original." That is to say, the c
will recuperate to within a small margin
the degree of efficiency possessed by it wh
it was last used; not to "within a small ma
gin of its original" efficiency, which woul
of course, be impossible.



BULLARD AUTOMATIC WRENCH

Specially adapted to Automobile use.

Just What You Want

How many times have you skinned your knuckles with the old-fashioned wrench? How many times has it slipped and taken the corner off a nut. How often has it gone cranky and refused to come off when you wanted it to? **No wonder you said things.** Wouldn't you like to have a wrench that won't slip and never balks? One that you can slip onto anything, anywhere, without adjusting it? **Buy a Bullard.** It's automatic, self adjusting. Works in a limited space, because there's no lost motion. Never cramps. Greatest power, longest wear. Made in 5 sizes, up to 3 inches capacity.

TO THE TRADE

We are in position to quote liberal discounts on your next year's requirements

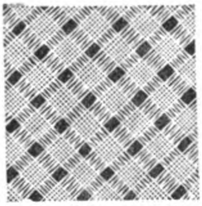
The Bullard Automatic Wrench Co.

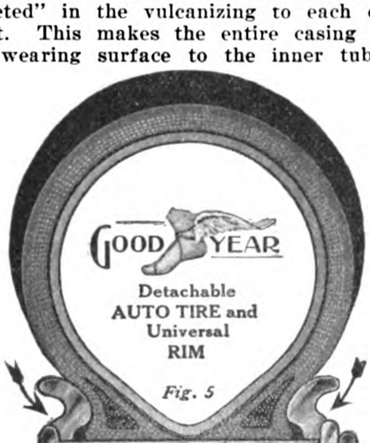
PROVIDENCE Incorporated RHODE ISLAND

Automobile Art Dept.

Goodyear 1906 Tire Features

The 1906 Goodyear automobile tire made by Goodyear Tire and Rubber Co., Akron, Ohio, has a valuable feature of construction in the "rivet fabric" which is used with alternate layers of rubber in building up the tire. This fabric is woven as shown in one of the accompanying cuts. The pure rubber part of the casing is made up of layers of rubber and rivet-fabric. The rubber penetrates through the square holes in the fabric, and in consequence each sheet of rubber is "riveted" in the vulcanizing to each other sheet. This makes the entire casing from the wearing surface to the inner tube in reality one solid sheet of rubber with fabric in between, instead of a layer of rubber and a layer of fabric.

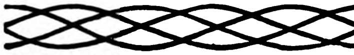

"Rivet Fabric" used in Goodyear 1906 Automobile Tires.

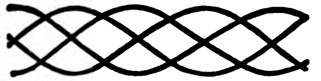


Cross Section Goodyear 1906 Automobile Tire.

This theoretically makes it impossible for sand-blisters to form, and in practice none have formed in tires which have been given hard service for over a year. This special "rivet fabric" gives back and forth under pressure, and allows the elasticity of the rubber full play. The hard rubber, the soft rubber and the special fabric together make a tire that is almost as durable as a solid tire, a tire difficult to puncture yet one which is as resilient as a man could reasonably ask. The outside layer of rubber on the tread, shown in black on the cut, is of specially made rubber which is hard and as tough as rawhide. This hard rubber tread and the soft Para rubber beneath are by a special process made into an integral mass and are inseparable. Thus the combination provides a hard protecting tread supported by a springy resilient mass.

Another valuable feature of the Goodyear construction, retained in the 1906 tire, is the vulcanizing of a mesh of piano wire in the
base of the tire to prevent creeping o
rim. This mesh of wire contracts wh
tire is inflated and causes the base
tire to closely grip the rim thus prev
creeping. The positions assumed by
wires both with tire inflated and deflat
shown herewith.


Wire mesh in base of Goodyear tires before tire is


Wire mesh in base of Goodyear tires after tire is

The Goodyear universal rim, broug
last year, is also retained, having
eminently satisfactory.

1906 Hartford and Dunlop Ti

The Hartford Rubber Works Co
Hartford, Conn., have some salient im
ments in their tires and rims for 1906
rims are so made that not only the Ha
Dunlop tire but any standard make of
er tire may be used on them. This is
plished by having rim edges or beads
straight wall on one side and grooved
other, so that a clincher can be subs
for a Hartford Dunlop by merely rev
the beads.

The Hartford clincher and the Ha
Dunlop are of the open-cure, wrapped
variety. Instead of vulcanizing the
separately several times and then
them one final cure, the whole tire i
canized at one operation and made and
in the same shape the tire assumes wh
service. This relieves the tension on th
ric and offsets any tendency it may ha
split.

Instead of lugs, to hold the Hartford
lop and Hartford clincher tire in pla
light endless metal band or floating rin
be inserted between the tube and the
of the tire to prevent creeping.

Should it become necessary to ride
flat, this band rests lightly on the inner
of the tire and effectually prevents cre
Another excellent feature of this fl
ring is, that it keeps moisture out of th
thus preventing rotting of the fabric.

The special Sea Island cotton fabric
in the tire will be stronger than prev
used.

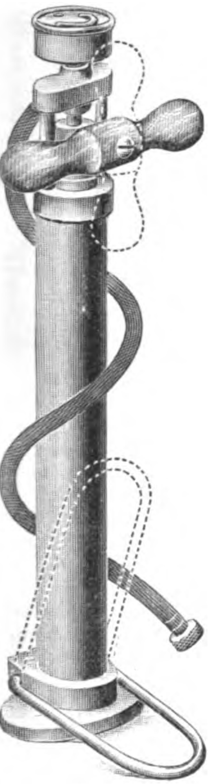
A strip of pure Para rubber is place
the outer layer of fabric, and before th
ber cover proper is applied a strip of
is incorporated which prevents wh
known as shuffling or blistering and als
in resisting puncture. The outer cover
tire is made of especially tough compo

To obtain more extensive facilities t
ter take care of the ever increasing d
for Honeycomb coolers, hoods, mufflers
the W. J. Kells Mfg. Co. have removed
Newark and Westside Avenues, Jersey
to 62-4-6 Van Winkle Avenue, same
They advise us that their business
doubled in the last three months.

The "Demo" Auto Tire Pump

The best pump made

The "Demo" Compound Tire Pump operates on both up d down stroke, but the delivery of air into the tire is made on e up stroke.



"DEMO"

It is a powerful pump, yet easy to operate; is compact—has folding base and handle and, it is fitted for a pressure gauge at the top.

It shows the highest degree of efficiency possible with the least amount of work.

The "Demo" has proved its superiority over all other tire pumps through competition.

Made of brass, highly polished.

Mr. Dealer: you should sell the "Demo".

Mr. Owner: see that you get one—the best pump made.

BRIDGEPORT BRASS CO.

Postal Telegraph Building
roadway and Murray Street - - NEW YORK

New Meyrowitz Goggles

Meyrowitz Goggle No. 3088 G.

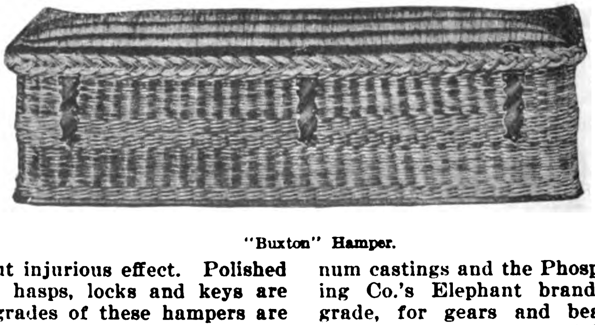
E. B. Meyrowitz, 104 E. 23rd St., New York, has added some new goggles to his line for 1906, one of them being shown herewith, No. 3088 G. This is a light goggle without mask and has collapsible cups with white or smoked lenses fitted in finely nickeled rims. The cups are edged with chenille and the leather nose-bridge is lined with the same material. The bands which pass around the head are of silk, reinforced at the cups with leather, and are adjustable. Price is $2.25. A goggle of the same style, but smaller, is listed at $2.

He has also added a goggle called the "Four-Way," so named because it has 4 lenses, each pair set at right angles to each side. These lenses are set in nickeled frames, to which is attached a mask of tan pigskin lined with white chamois, and edged with velvet. Adjustable silk elastic bands are attached. This goggle folds up flat. Price is $1.50.

Mr. Meyrowitz is this year also handling volt and ammeters, offering various types.

Buxton Hampers and Trunks

B. W. Buxton Hamper Co., 7 Taylor St., Springfield, Mass., manufacture a line of woven reed hampers and trunks, the latter being leather covered. The "Buxton" hampers are made of the best German imported reed, which is soft and weaves closely. The linings are of heavy patent leather, fitted closely to the hamper and rendering it dust- and water-proof. In finishing these hampers they use a special preparation which preserves the reed and can be washed with soap and water without injurious effect. Polished brass hinges and hasps, locks and keys are provided. Two grades of these hampers are provided, one in a fine close woven reed and the other in a somewhat larger reed. They have styles to suit all cars and can fill s cial requirements on order.

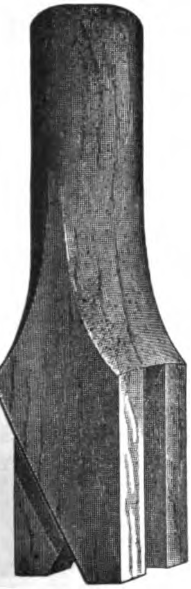


"Buxton" Hamper.

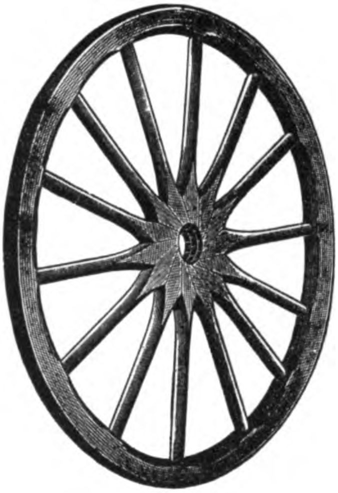
The "Buxton" trunks are made of reed w an outer covering of leather. The lining a tan colored rubber cloth. These also dust- and water-proof. All fittings are in p ished brass. The construction of these trun is both strong and light and they are tractive in appearance. Several stock si are made, ranging from 28x10x10 in. at $ to 40x16x14, at $28. Special sizes can had on order.

"Buxton" Trunk.

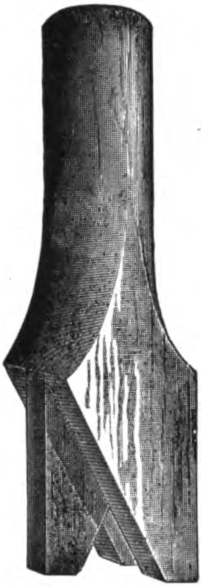
The Standard Foundry Co., Hartfo Conn., have sold their iron foundry busin and henceforth will devote their time to m ing aluminum and bronze castings for au mobile work. They use the special all of the Pittsburgh Reduction Co. for alu num castings and the Phosphor Bronze Sm ing Co.'s Elephant brand metal, B. & grade, for gears and bearings. They a furnish an excellent special gear and bear metal.



PATENTED



FINISHED WOOD WHEEL



Why be Satisfied With the Old Style?

“The Schwarz Wheel”

is scientifically correct and practically perfect. It is the strongest artillery wheel in the world. There is but one thing required to convince you that the **Schwarz Wheel** is superior to any other kind on the market, and that is investigation. For mutually profitable reasons we hope that you will either get the opinion of those who have used the **Schwarz Wheel** or make a test for yourself.

THE CONSTRUCTION OF THIS WHEEL INSURES ITS BEING PERFECTLY TRUE

The spokes are put together without a hub, under pressure, the spokes nterlocking one another. Being the same width in the center of the hub as n the outside, they cannot loosen. For the same reason the tenon of this poke is longer than that of any other, permitting the use of a hub of a maller diameter, yet still retaining the same spoke support.

When hub flanges are bolted on they have the same appearance as any other artillery wheel

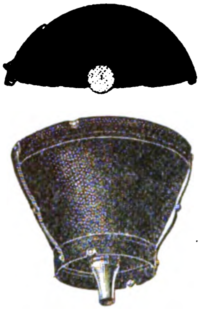
THE SCHWARZ WHEEL COMPANY

Office, Mint Arcade Building, Juniper & Chestnut Sts., Philadelphia
Factory, 29th and Glenwood Ave.

The Mitchell Punctureless Pneumatic Tires

The Mitchell Punctureless Pneumatic Tire Co., 324 Essex Street, Swampscott, Mass., have brought out an automobile tire with the air compartment so hidden and protected as to prevent puncture and greatly eliminate the possibility of a blow out. The inner pneumatic tube, which is thicker than usual, rests on the felloe of the wheel. Between the inner tube and outer tire are rubber plugs, held in place by a metal clincher, through the sections of which they play freely. The plugs overlap at the ends, presenting a continuous surface. The outer tire is of practically the same construction as other pneumatic tires and rests on the plugs, about three inches above the inner tube. The whole is enclosed at the sides by steel flanges which are bolted together, the bolts passing through the clincher, holding the tire firmly and eliminates the danger of its coming off even when greatly strained. The inner tube, or air cushion, acts as check for the outer tire, which rests on the rubber plugs between the two, when subjected to any weight. The resiliency resulting from the motion is claimed to be free from all friction and to be as great as that obtained through the use of the pneumatic tire. A set of tires constructed after this plan has been run 7000 miles and show little signs of wear.

Mitchell Punctureless Pneumatic Tire on a wheel. This tire has been ridden 7000 miles when the Photograph was taken.



The Duplex Funnel, folded and open.

The Duplex Basin, folded and open.

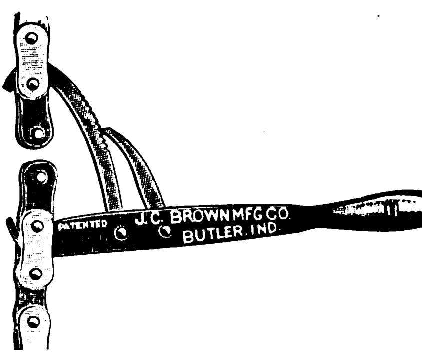
Duplex Folding Funnels and Basins

Duplex Folding Pail Co., 114 E. 14th St., New York City, are putting out a folding funnel and a folding basin, both handy devices for the automobilist. These, like their folding pail, are made of durable, waterproof material with spring steel, rust-pr
metal parts. Gasoline, kerosene and na
tha have no deleterious effect on the mate
used, and it dries quickly. When exten
these products are as substantial as sol
constructed articles of this kind, and w
folded they occupy very little space in
tool kit. The funnel is 7½ in. in diam
at the top and 4¾ in. at the bottom by 5
deep. It folds into a space 7½x3½x1½
Price is $1.50.

The basin lists at $1.00. It is 12 in. ac
the top, 10 in. at the bottom and 5½ in. d
folding into a space 12¾x6¾x1¾ in.

The Brown Ratchet Chain Tool

The J. C. Brown Chain Tool Mfg. Co.
Butler, Ind., are putting out a ratchet ch
tool which is cleverly designed and of ap
ent merit. It consists of a straight blade
handle having a curved end to grip one
of the chain, and a swinging arm also
vided with a hooked end, which grips
other end of the chain to be repaired.
swinging arm is notched on its upper e
and a pawl which is pivoted to the m
blade or handle just above the swinging a
engages in these notches. Thus the opera
can draw the links as close together as
sired, and then the tool will hold them
that relation while he puts in the connect
link. This tool enables one to repair a d
chain in a few minutes, eliminating the ne
sity of shifting the rear axle forward or
moving the chain from the machine. The
lists at 75 cents and will be sent to any
dress prepaid for 10 cents extra.



The Brown Ratchet Chain Tool.

The manufacturers furnish one of th
tools free with every set of their "Bur
anti-skid attachments for tires. These
tachments are held by comparatively
chains and the tool is used in connecting
chain ends when putting them on the tire

Tom Murray, Jackson Boulevard,
Board of Trade Building, Chicago, Ill., is
ting out a cravenette rain coat for auto
bilists which he sells at the low figure of
These coats are stylishly cut and well m
They come in tan, gray and black, and w
they have no "rain coat" appearance, af
protection against any but the seve
storms.

LUNKENHEIMER 1906 CATALOG

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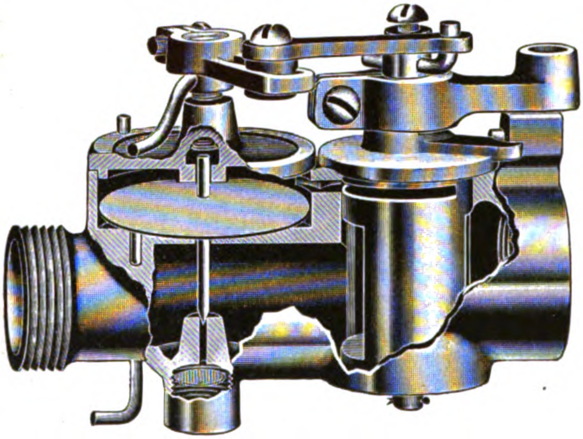
Town
State

A.T.J.

1906 Garllus Carbureter

The cut herewith gives a partially interior view of the 1906 Garllus carburetor, which is now manufactured by the Winkley Company, P. O. Box 243, Detroit, Mich., formerly of Hartford, Conn. This carburetor has no float, and its special feature is the form of the main body, which is a straight air passage. In this air passage, standing at right angles to the travel of the incoming air, is a gasoline nozzle which is closed by a needle point connected to a disc located in a separate chamber, the chamber being connected with the inner passage, so that the needle point is raised by the suction of the engine and closed automatically as soon as the suction ceases.



1906 Garllus Carburetor.

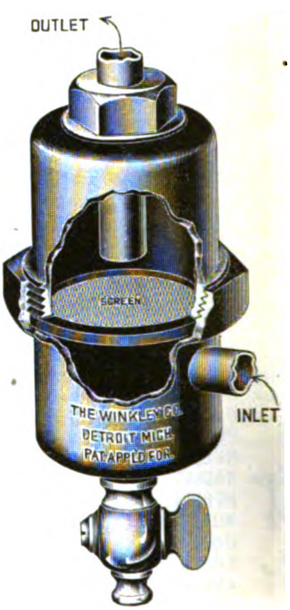
The amount of lift given to the needle point is governed by an adjusting screw above it and controls the amount of gasoline admitted for each charge; very fine adjustments may be obtained to suit the kind and peculiarities of the engine.

With the throttle type of carburetor a link connection is provided between the throttle stem and the screw that governs the needle point, so that as the throttle is opened or closed the amount of gasoline used is varied proportionately. As the needle point is raised gravity and syphonic action promptly deliver gasoline to the inrushing air and very fine spray is produced. The varying levels of gasoline in the supply tank do not affect the action of the delivery at the nozzle on account of the injector feature of its action, hence a float is not needed and the varied troubles due to change in levels of floats are avoided.

For 2-cycle engines, of the two port kinds, a neat and efficient check valve is provided, and will attach to either plain or throttle type of carburetor. For 2-cycle engines of three port kind the carburetor is particularly fitted; with its straight, unobstructed air passage the very best results are obtained.

The 1906 Eureka Separator

The Winkley Mfg. Co., P. O. Box 243, Detroit, Mich., which now manufactures the "Eureka" separator, has brought out a new model for the 1906 trade, a sectional vi of which is shown herewith. The princip of its construction is quite simple, but t device is said to be very efficient. It co sists principally of a shell or casing in tw parts, held together by threads, a screen se arating the interior of the two parts. T gasoline inlet is in the lower half of the ca ing below the screen, and the gasoline ri through the screen, finally making its ex from the top of the upper half of the casin A tube extends from a point a little abo the screen out through the top of the devic A drain cock is provided at the bottom the shell to permit periodical removal of se iment and water. As many so-called igniti troubles are the result of the presence water in the fuel, this separator is certain a desirable accessory. It is made in thr sizes, ranging in price from $1.75 to $3.5 these three sizes being sufficient for any r quirement.



1906 Eureka Separator.

The Albright Manufacturing Compan Columbus, Ga., has recently been organiz to take over the manufacture of the "A bright" spark plug, formerly made by t Camp Cycle Company, Columbus, Ga., an will be able to promptly fill all orders, ha ing ample manufacturing facilities.

The A. & J. Mfg. Co., Chicago, Ill., a putting out a sample package of their "Bra iron" and flux to accomodate those who d sire to try cast iron brazing on a small sca The trial package contains "Braziron" an flux, each put up in a neat box, both e closed in a larger box, and mailed postpa upon receipt of ten two cent stamps. Th regular box of "Braziron" and flux sells f 60 cents postpaid. A complete outfit, consis ing of one box of "Braziron," one box of flu and one package of spelter, sells for $1.0 postpaid.

MOTOR SUPPLIES

OF ALL KINDS

All Leading Lines Carried in Stock

Newest Products

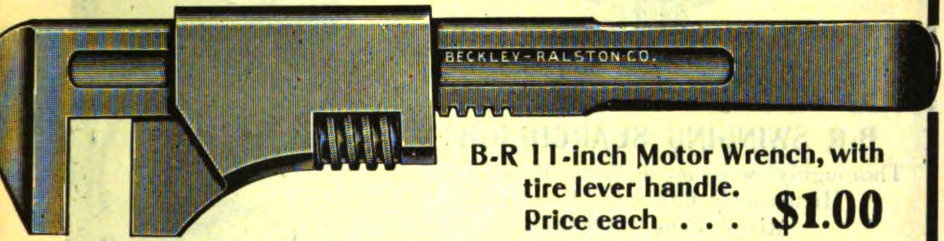
Goods Right

Service Prompt

Prices Low

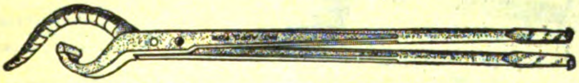
Satisfaction

Of advantage to both of us for you to have our catalog Sent on request


BECKLEY-RALSTON-CO.

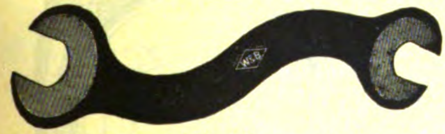
B-R 11-inch Motor Wrench, with tire lever handle.
Price each . . . $1.00

A full line of motor wrenches, from 9 to 18 inches. Forged from high carbon steel, carefully machined, accurately fitted, and handsomely finished.



MAXWELL TIRE TONGS

The really successful tire tool. Compact, light, always ready for use. Does the work. Jaws are rawhide wrapped preventing injury to casing. Price each **$2.00**

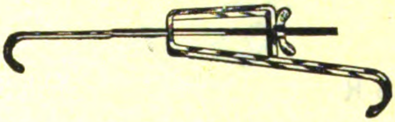


Bulldog S Wrenches

Set of 4. Fits standard size nuts. Short heavy pattern. Very convenient.

PRICE PER SET

Black, $ .60 Finished, $1 20



Auto Chain Repair Tool

Holds chain in position while repairs are being made.

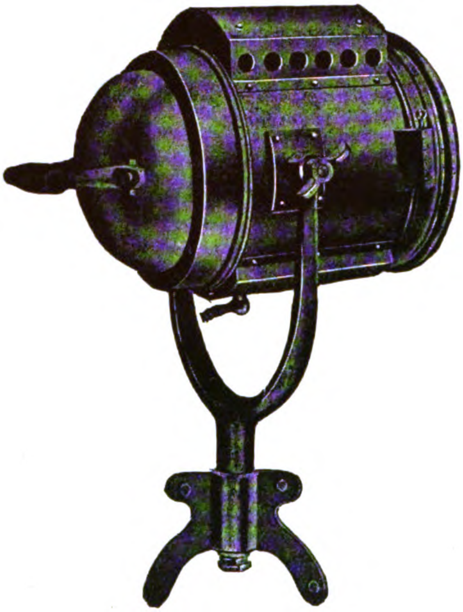
PRICE each, 25c. Large, for Shop use, 35c.

THE BECKLEY-RALSTON CO.

74, 76, and 78 Michigan Avenue CHICAGO

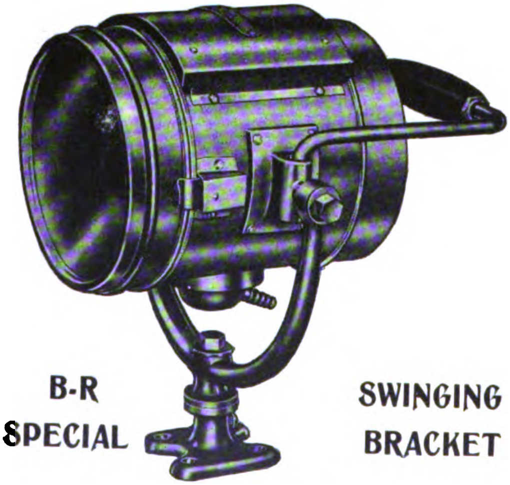
MOTOR SUPPLIES OF ALL KINDS

All Leading Lines Carried in Stock



B-R SWINGING SEARCHLIGHT

Thoroughly well made from heavy brass. Handsomely finished. B. and L. Mirror Lens. All sizes.



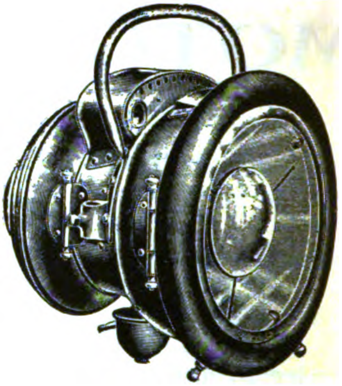
B-R SPECIAL SWINGING BRACKET

Converts ordinary searchlight into swinging type. Fits 6 or 7 inch lamp. Made from hard brass. Brass finished.

With lamp handle price each, $3.00

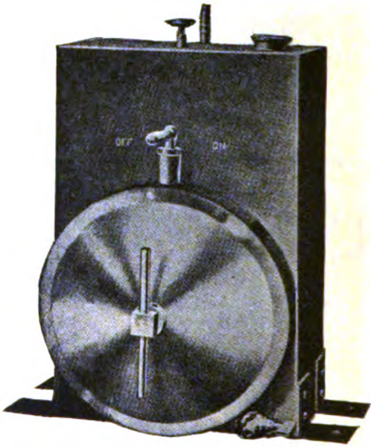
THE BECKLEY-RALSTON CO.

74, 76 and 78 Michigan Ave., Chicago



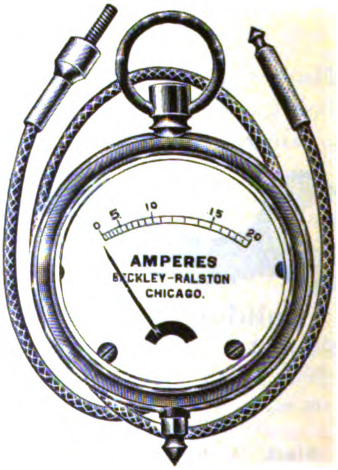
B-R PARABOLE HEADLIGHT

Strictly high-grade goods. Very handsome. Mediu grades in similar shape. Prices right.



E and J GENERATOR

Carbide chamber removable. Very carefully made, attractive in design, and highly finished. Same old principle—a proved success. Single or double. Price each, $10.00



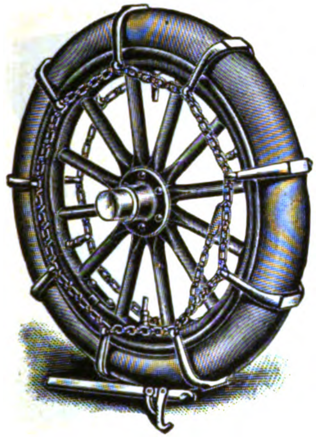
B-R AMPERE METER

Register quickly and accurately. Guaranteed. Price each, $8.00.

B-R VOLT-METER

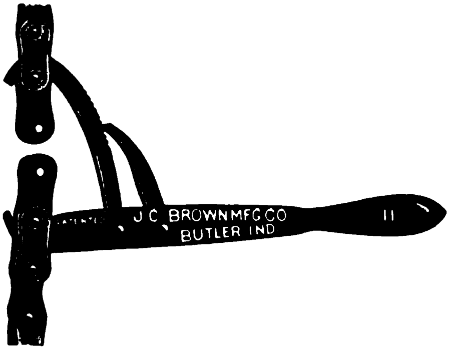
Same style and size. Price each, $8.00

MOTOR SUPPLIES
OF ALL KINDS
All Leading Lines Carried in Stock



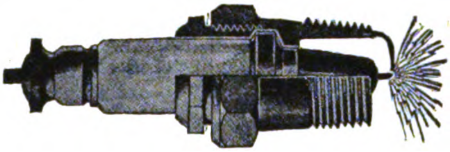
Burke Climber and Non-Skidding Device

The latest device for the purpose. Will ot injure casing and positively will not skid. ll sizes. Description and price on request.


J C BROWN MFG CO
BUTLER IND

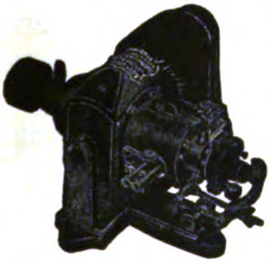
Burke Chain Repair Tool

Beyond question the best tool of the kind for shop use. Locks and holds chain in position while repair is made. Price each, $1.00.

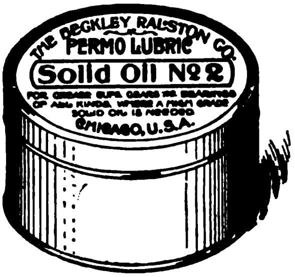


Nevermiss Plug

Positively gave best satisfaction of any plug on the market in 1905. Can be cleaned without removing porcelain. Many desirable features Half inch and metric threads. Price each, $1.00

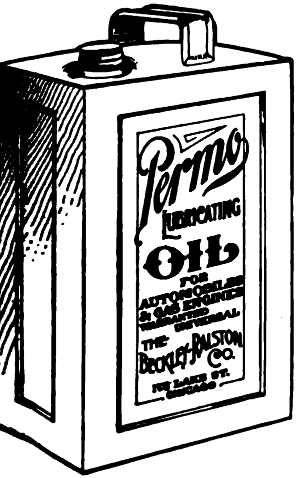


Dynamos, Dry Cells, Storage atteries. Coils, Cable, Battery onnections and all Ignition pparatus.


THE BECKLEY RALSTON CO.
PERMO LUBRIC
Solid Oil No 2
FOR GREASE CUPS, GEARS OR BEARINGS OF ALL KINDS, WHERE A HIGH GRADE SOLID OIL IS NEEDED
CHICAGO, U.S.A.

Permo Oils

Are best for Motor use. Lubricating, Cylinder, Solid and Graphiteoil. Best of satisfaction in 1905.


Permo
LUBRICATING
OIL
FOR
AUTOMOBILES
& GAS ENGINES
WARRANTED
UNIVERSAL
THE
BECKLEY-RALSTON
CO.
LAKE ST.
CHICAGO

B-R Tube Patches

Pure Gum Patches especially made for auto tube work. We have absolutely the best proposition and the best price on these goods.

THE BECKLEY-RALSTON CO.
74, 76 and 78 Michigan Avenue, Chicago

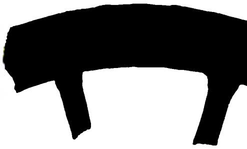
MOTOR SUPPLIES

OF ALL KINDS

All Leading Lines Carried in Stock

G and J Inside Tire Sleeve

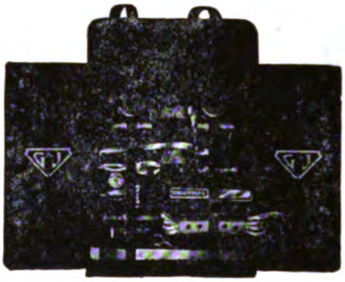
G and J Outside Tire Sleeve



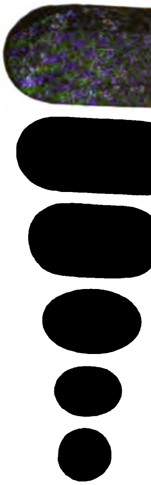
G and J Repair Stra

CEMENT
Air Tube Repair
G&J Tire Co.

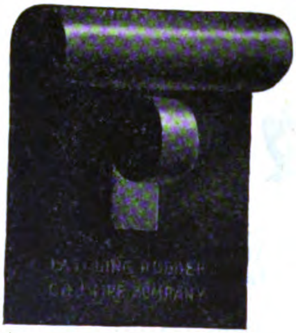
G and J Patching Cement



G and J Special Repair Kit
Containing everything necessary for repairs



**G and J Air T
Patches**


PATCHING RUBBER
G&J TIRE COMPANY

G and J Patching Rubber

G and J Horn

G and J Air Tube Bag
Waterproof

G and J Tire Case

G and J Gas

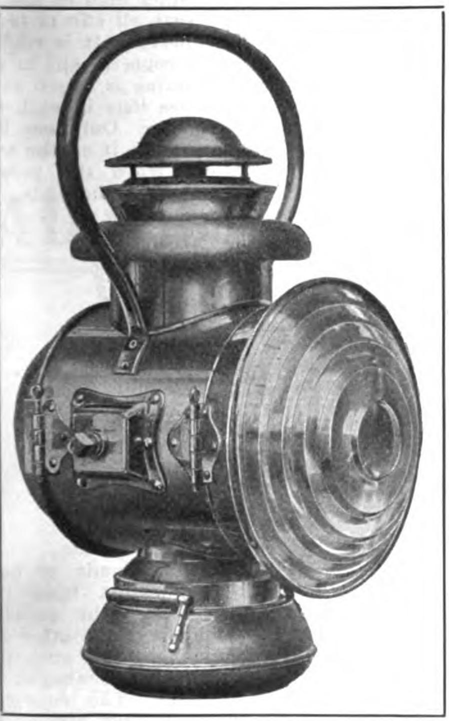
THE BECKLEY-RALSTON CO.

74, 76 and 78 Michigan A
CHICAGO

AN EPOCH IN THE HISTORY OF OIL LAMPS

The TOURIST Cold Blast lamp for 1906 is a wonderful light producer and is the most dependable path finder made.

SEE THE LENS?



Burns common kerosene, will not blow out or jar out, emits no odor and is entirely free from the usual lamp troubles.

We can't pick a car for you but our oil lamps are so superior they are easily recognized as absolutely the best on the market. They are the result of 35 years experience in making out door lamps.

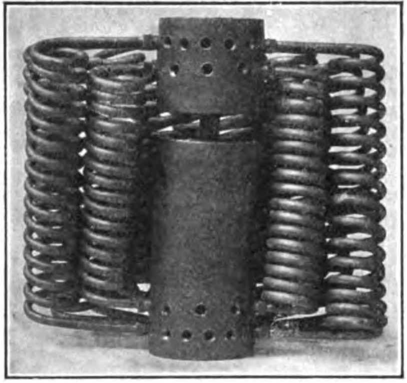
WRITE FOR BOOKLET SHOWING COMPLETE LINE.

C. T. HAM MANUFACTURING COMPANY

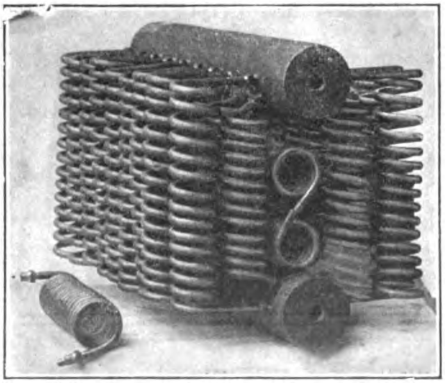
ROCHESTER, N. Y.

Ofeldt Flash and Water Tube Boilers

August Ofeldt Boiler Co., 341 W. 44th street, New York, are manufacturing a line of flash and water tube boilers for automobile and marine use. The flash type consists of two concentric rows of spirally formed tubing surrounding a central drum section. There are two drums, as shown in the sectional view of the boiler herewith. Water is admitted to the top drum and the steam taken out at the bottom of the lower drum. Both rows of tube coils are connected with each drum through parallel rows of holes, which are shown in the cut. These coils are connected in a slanting position so as to get the full benefit of the fire.



Half section Ofeldt Circular Flash Boiler. This boiler has two separate drums, water being taken into top drum and the steam out of the lower one. No gauge glass is required.



Ofeldt square coil boiler, can be used as flash or water tube boiler. Circulation is established by connecting the two drums.

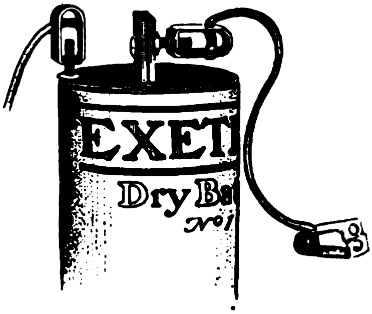
The Ofeldt square boiler shown can be used either as a flash type or a water tube type of generator. By connecting the two drums circulation is established and the boiler can be used in automobile or marine use, same as the other one. A casing is furnished for these boilers with the flue for carrying off the fumes either at the top or side as desired.

Ofeldt boilers are furnished in 7 sizes, 4, 6, 8, 10, 15, 18, and 25 H. P., the ratin ing based on the evaporation of 30 lb water per horse power. The 4 H. P. b measures 16x18 inches and weighs 45 It lists at $60. The 6 H. P. boiler is 1 inches and weighs 80 lbs., listing at The 8 H. P. boiler lists at $110. It we 100 lbs. and measures 18x22 inches.

They also make 3 stock sizes of kero burners, 14, 16 and 18 in. diameters, listi $20, $22 and $30 respectively. Larger can be furnished if desired. These bur start with a match, same as a gasoline b er and burn without odor.

"Bulldog" Battery Connection

The B. & B. Co., Plainfield, N. J., manufacturing a simply constructed bat connection adapted to either high or low sion circuits, which resists all efforts to loose or become disconnected. It is mad phosphor bronze spring copper, bent in a way that when the spring is closed as as possible the two holes (one in each end of the spring) register. Only one is necessary to adjust or slip it on the s which it grips tightly when the pres of the hand is removed from the ends.



The "Bulldog" Battery Connection.

connection cable, which is made of he single conductor black cotton lamp c passes through a hole near the round spring end and is soldered to the other The Bulldog connection obviates such t bles as imperfect contact and leakages, saves time in connecting. The connec also makes efficient spark plug joining connecting; any two wires can be ac plished by fastening one of these device each of the two ends of the wire and joi the two connections by means of a s screw.

F. N. Stevens and Louis Schwab, Stevens & Co., New York City, jobber bicycles and automobile specialties, ha controlling interest in the recently inco ated Esco Mfg. Co., which has establi in New York a large factory for the m facture of auto horns, flexible tubing, screens, etc. These will all be markete Stevens & Co., who will also make all chases of material for the Esco Co. Esco Mfg. Co. owns the molds from the horn bulbs are made and these bulb claimed equal to the best imported arti

AUTO TOPS

~

CAPE AND CANOPY
SLIP COVERS
LIMOUSINE BODIES
WIND SHIELDS
BAGGAGE RACKS

ADJUSTABLE TIRE IRONS

For the carrying of one or two Tires when touring. Made in Brass or Painted. These Irons can be removed from the car in one minute and replaced in same length of time.

All our goods are made to order with finest of material and workmanship
WE ARE THE LARGEST HOUSE IN OUR LINE. Send for Catalogue

Telephones:
4770 Columbus
4771 "

W. J. DUANE & CO.

OFFICE AND FACTORY, 304 W. 54th ST.
SALESROOM, 1771 BROADWAY
NEW YORK

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Chas. E. Miller's New Specialties for 1906

Among the new things to which C. E. Miller, the well-known jobber of 97-101 Reade St., New York, is calling special attention at this time are the "Diamond M" vulcanizing substitute, the "Diamond M" anti-freeze compound and the 1906 "Brampton" chains, all of which are shown herewith.

EMERY CLOTH
ACID CURE
M
CEMENT
CHAS. E. MILLER
VULCANIZING SUBSTITUTE
M'f'd By
CHAS. E. MILLER
97-99-101 READE ST.
NEW YORK CITY
AUTO TIRE REPAIR OUTFIT

Miller's "Diamond M" Vulcanizing Substitute.

The Diamond M vulcanizing substitute outfit illustrated is put up in convenient form for tourists, and contains ¼ pint of cement, ¼ pint of acid cure solution, emery cloth and brushes for applying the cement and acid cure. This vulcanizing substitute makes a permanent tire repair, producing the same effect as vulcanization. As the effect is produced instantaneously, the advantages of the preparation are apparent. When the repair is finished the two pieces of rubber are integral, just like a solid piece. The whole outfit is furnished in a wooden box, with sliding cover, and does not take up much room in the tool box or basket. For shop use he is offering a large outfit containing a greater amount of the material.

THE IDEAL PAT. OPEN CAN
M
ANTI-FREEZE COMPOUND
CHAS. E. MILLER
N.Y.

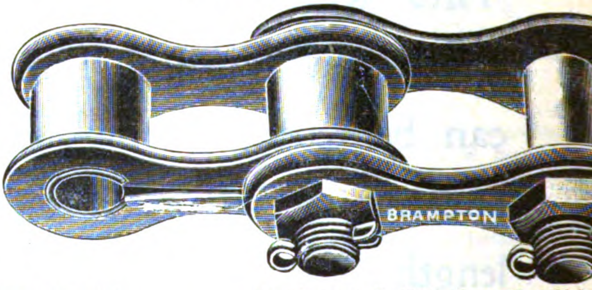
The Miller "Diamond M" Anti-Freeze Compound.

The Diamond M anti-freeze compound is a seasonable article at this time of the year, when freezing cylinders are a possibility. Mr. Miller has experimented with this compound on his own car, and offers it with the assurance that it will prove effective and satisfactory. Ten pounds of the compound are added to two gallons of water in order to make a cooling solution which will not freeze at 15 degrees below zero. To get a solution which will not freeze at 30 degrees below zero, ten pounds of the compound are added to six quarts of water. A ten pound can c
compound lists at $1.00.

The illustration of the 1906 Bra
chain connecting link shows a full si
in. pitch Brampton roller chain, for wh
is sole American selling agent. This st
connecting link will be used in all
Brampton roller chains. It will be n
that a bolt and nut is used in making c
tion with the cotter pin, this method o
tening having proven popular in this co
The side plates of the chain are chamf
All parts of the chain are polished and
spun rivets are used. One of the mo
portant claims made for the Brampton
is its great strength, which is indeed a
able feature in a chain. They are us
a large number of American cars an
sold in this country at the same pr
American made chains.

O-T-O. Oils and Greases

Allerton Oil and Grease Co., 78
street, New York City, manufacture a
cellent quality grease termed O-T-O,
they claim to be free from carbon
matter and to have the highest fire
highest viscosity and lowest cold tes
tainable. It will maintain its consiste
all temperatures. Their light, mediu
heavy gas engine cylinder oils are esp
adapted for automobiles, motor boat
slow speed motors respectively. Thes
and their O-T-O steam filtered cylind
all sell in gallon cans for $1.00. O-T-O
heated steam cylinder oils and O-T-O
cating oil sell in gallon cans for $1.1
80c. respectively. Other greases are
mica, graphite and yellow, which sell i
cans for $1.00.



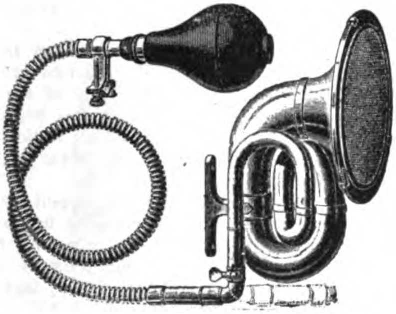
1906 "Brampton" Chain Connecting Link.

Ideal Plating Company, 3 Appleton S
Boston, Mass., are now furnishing
malleable cast forward extension an
pander stems in three sizes, ¾, 13-16 a
inch diameter.

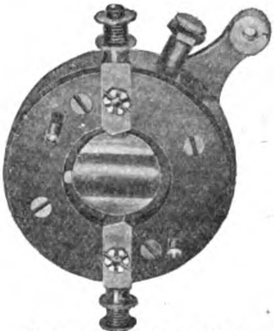
Clarence Brooks & Co., 249-277 Ch
Street, Newark, N. J., manufacture
of fine varnishes for all purposes. So
their varnishes are suitable for body
ing, and they also offer spar varnish,
would be of interest to the motor boat

M. H. Fairbanks & Bro., Chicago, Ill.
ers of special cleaning preparations, an
ting on the market a polish, both in pow
and liquid forms, for metals of all kind
is claimed to be free from acids or oth
jurious substances.

LARGEST AUTOMOBILE SUPPLY HOUSE
in the Middle West

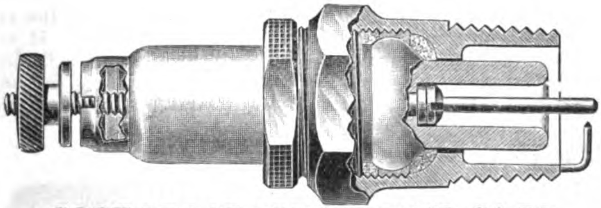


NEW STYLE DRAGON
$10.00

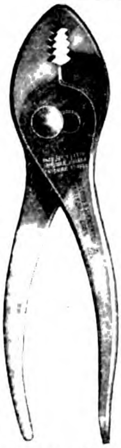


SPLITDORF TIMERS

1 Cylinder	$ 9.00
2 Cylinders	10.00
3 Cylinders	11.00
4 Cylinders	12.00



SOOT-PROOF PLUG, RETAIL $1.50



Combination Pliers, 75c

A good discount to the trade

Send for our 208-page catalog, which contains illustrations and descriptions of all the standard equipments for the automobile. We do not handle freaks, but we carry in stock everything that is worth listing. Our prices are right, and our shipments are prompt. Once our customer, always our customer.

A. L. DYKE AUTOMOBILE SUPPLY CO.

Olive and Walton Sts., St. Louis, Mo.

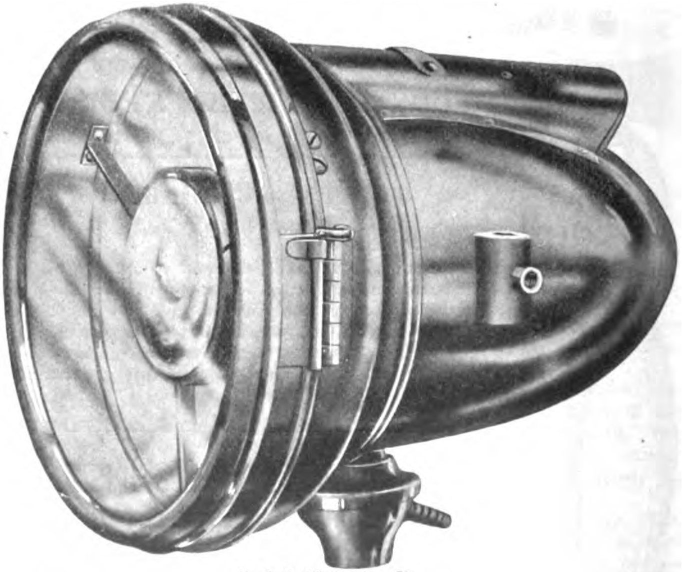
ROBT. F. BRITTON, Pres. and Mgr.
ROY F. BRITTON, Sec. and Treas.

E. & J. 1906 Lamps

Edmunds & Jones Manufacturing Co., 315 Riopelle Street, Detroit, Mich., are offering a very handsome line of lamps for 1906, and the besides a new gas generator.

The E. & J. Model No. 72 lamp is a head light for use with a separate generator and is provided with a parabola lens. This is a handsome style of lamp for large cars and is made in full polished brass in two sizes. Size A is 10½ inches long by 10½ inches high and the flange is 9½ inches in diameter. It is fited with a ¾ ft. burner. Size B is 11⅝ inches long by 11 inches high with 11 inch flange and has a 1 foot burner. A very convenient and practical feature of this lamp is the removable burner.

E. & J. Model No. 72.



E. & J. Model No. 70a.

Number 70 A is a bullet style lamp with parabola lens and removable burner. It is finished in full polished brass and can be furnished with a lens mirror reflector if desired. This lamp is 12 ins. long and 9¼ ins. high, flange 9 ins. in diameter, and a ⅝ burner is fitted.

Model 71 is fitted with a lens mirror search light reflector and is built on very symmet
lines. This lamp is furnished in three s
Size E is 8½ ins. long by 9½ ins. high by
ins. across the flange, being fitted with
ft. burner. Size F is 10 ins. long 9⅝ ins.
by 9⅜ ins. across flange, and has a ⅝
burner. Size G is 10½ ins. long by 10
high and 10¾ across the flange, being f
with a ¾ ft. burner.

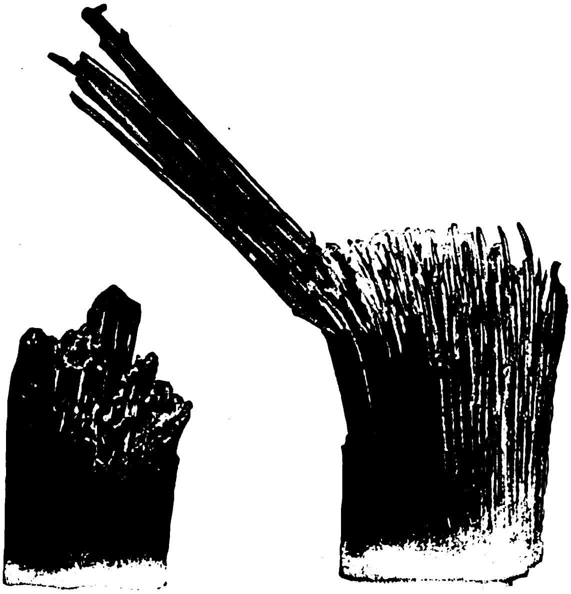
Number 68 A is another separate gener
lamp with parabola lens. The finish is
full polished brass. This lamp has a ren
able burner. It is 10 inches in both dir
sions and has a 9½ inch diameter flange.
burner is ¾ foot.

Number 69 A has a lens mirror refle
and is made in full polished brass. This
long rakish looking lamp of very neat des
It is 11½ inches long and 8½ inches hig
front, sloping back in bullet shape.
flange is 9⅝ ins. in diameter and has a ⅝
burner.

Number 167 is equipped with a mi
search light reflector and finished in full
ished brass. Three sizes of this style
offered. A, 9¾ inches long, B, 10 inches l
C, 10½ inches long, all 9½ inches high.
flanges are respectively 9, 9¾, and 10½ in
in diameter, and the mirrors 5, 6, and 7 in
in diameter. Size A has a ½ foot bur
Size B ⅝, C ¾ foot.

Number 167 is a search light with mi
lens reflector. Like the rest it is finishe
full polished brass. It can be had in
sizes. Size A has a 6 inch mirror and i
inches long by 18¼ inches high, flange b
9½ inches in diameter. Size B is the s
height and is one inch longer and has a
inch larger mirror and flange. Size A ha
½ foot burner and size B ¾ foot. This la
is provided with a handle at the rear to s
its position and is mounted on a sw
bracket.

Number 66 is a lamp of plain design
one which is easily kept clean, having



The "short" fracture shown above, while characteristic of poor oak, happens to show the fracture of poor hickory. The other fracture shows the quality of "Imperial" spokes.

Talks on Wheel Making

No. 5

A bursted tire is robbed of its danger if the car is equipped with "Imperial" wheels.

The asset value of a car only occasionally obtrudes itself upon the attention of a buyer. And yet it is a matter which should give him deep and constant concern. "For what is worth in anything, but so much money as 'twill bring."

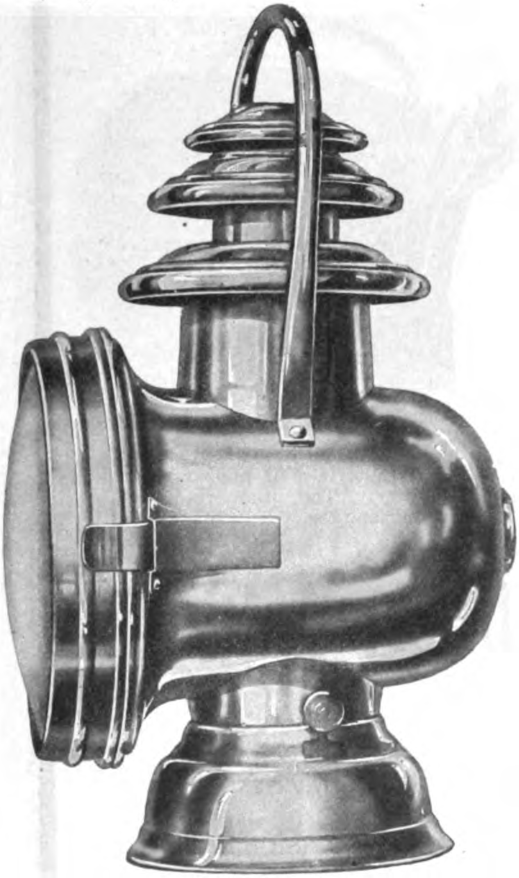
This value cannot be maintained if the components of the car are of indifferent design or material. Cheap wheels impair asset values. "Imperial" wheels help in preserving them.

The excellence of "Imperial" wheels is based upon the perfection and refinement of orthodox methods.

Imperial Wheel Company, Flint, Mich.

Selling Agent, HAYDEN EAMES, Cleveland, Ohio

irregularities of surface. It is fitted with a mirror search light reflector and can be had with a copper flange if desired, being finished usually in full polished brass, as are the other E. & J. lamps. This lamp is furnished with three sizes of mirror, 5, 6 and 7 ins. in diameter, all three styles being 8 ins. long by 9½ ins. high.



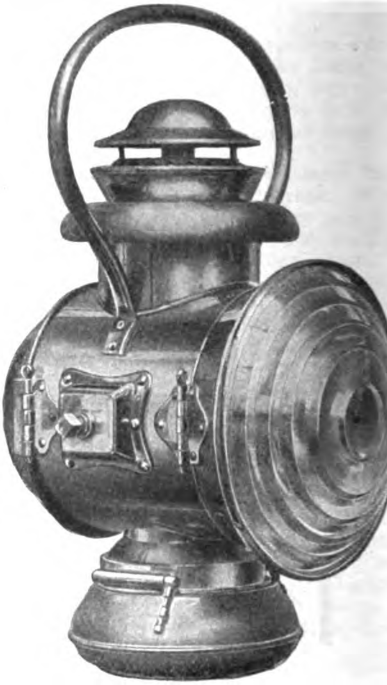
E. & J. Model No. 74.

Number 74 is an oil side lamp in full polished brass made to fit a combination Standard Prop, round or flat. This lamp is 14 inches high and 8¼ inches deep, having a flange 6⅜ inches in diameter.

They are also furnishing an oil tail lamp known as Model No. 75. This lamp is 12 ins. high by 6½ ins. deep, and has a 5-in. flange.

Ham Cold Blast "Tourist" Lamp

C. T. Ham Mfg. Co., 731 Oak Ave., Rochester, N. Y., have brought out a new lamp for 1906 called the "Tourist." The most prominent feature exteriorly in the lamp is the corrugated lens which is said to concentrate the light rays in the centre with the result that the light is carried a great deal farther in advance of the car than the plain lens would carry it. The "Tourist" is being used with great satisfaction on small cars as a head light in place of acetylene lamps, the "Tourist" being an oil burning lamp. It will,
no doubt, also be found satisfactory for
on large cars should, for any reason,
acetylene lamp fail to burn. The "Tou
is 9¼ inches long and 14 inches in ext
height, the bail extending one inch above
top of the dome. The flange is 6½ inche
diameter and the corrugated lens 6 3-8 in
Price is $10.00 in polished brass.



Ham Cold Blast "Tourist" Lamp.

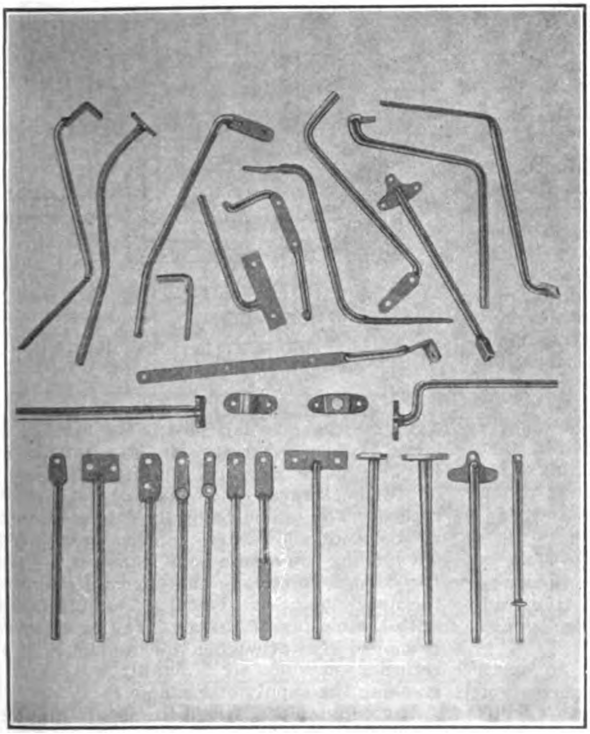
In general details it follows the same
as the "Aurora" which has been a re
model with the Ham Company for some t
the corrugated lens being the principal di
ence.

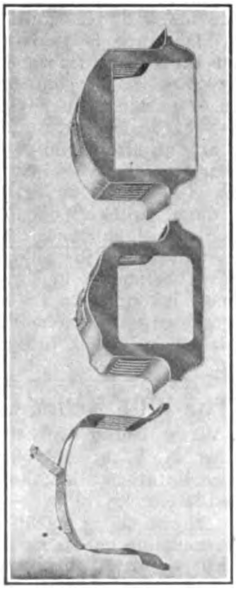
Baum's Lubricants

Besides the automobile soap which has
previously mentioned in these columns
product of Baum's Castorine Co. of R
N. Y., they also manufacture oil, grease
graphite grease put up especially for aut
bile use. "Baum's Auto Oil" is espec
adapted for gasoline engine cylinder lub
tion, having a high fire and viscosity
Having also a low cold test, it is sui
for use in cold weather or in cold clim
It is put up in two grades of consistenc
and B, for air and water cooled cylin
respectively; also in "C" grade for stean
gine lubrication.

Their "Auto Grease" is made especiall
gears and bearings, particularly for those
do not care to use a graphite grease, a
a pure yellow article, clean and smooth.
also have a graphite grease adapted for c
and gear use.

E. Hill, Jr., Norwalk, Conn., has p
the sole selling agency for the Hill gas
lock valve in the hands of Janney, Stein
& Co., Philadelphia.





HAYES MFG. CO., Detroit, Mich.

420-440 Maybury Grand Ave.

The Jones Speedometer-Odometer 1906 Model

The latest type of Jones Speedometer-Odometer is illustrated herewith. The principle of centrifugal force, on which the operation of these instruments depends, is retained in the new model because it admits of simple construction and produces compactness, durability and accuracy.

The speed is indicated whenever the car is moving, whether forward or backward, by the hand pointing to large readable figures on the metal dial. Dials are made to read the speed up to 50, 60 and 100 miles per hour. The season mileage registers up to 10,000 miles. The trip mileage registers up to 100 miles and may be instantly reset to zero by simply pushing a button.

In both the "trip" and "season" Odometer columns the miles are registered in large readable black figures and the tenths in red figures. Distance is registered cumulatively whether the car go forward or backward.

1906 Jones Speedometer-Odometer, showing how bracket permits of adjustment so that the dial may be presented at any desired angle.

The vertical shaft connection—adjustable—permits of passing the flexible shaft through the dashboard, down through the floor of the car, or around either end of the dash to either front car wheel. The instruments are suitable for either right or left hand attachment.

The dash bracket occupies a triangular space on the dashboard, 2½ inches high by 1¾ base and is adjustable to permit of the instrument being set at any desired angle.

The new instruments are incased in a dust-proof brass cup and are self-lubricating. They are finished in either brass, nickel or plate polished.

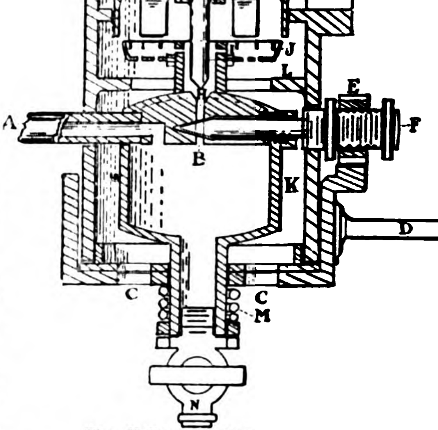
The 1906 Kellog Carburetor

The Wray Pump and Register Company, Rochester, N. Y., are introducing to the trade a new carburetor called the "Kellogg" which we illustrate.

When the Kellogg carburetor is in operation the gasoline enters at A, filling reservoir B. Air is admitted through ports CC, which are opened by the operating lever D. The damper, which is of cup form, is provided with teeth along its upper edge, which mesh with pinion E, which is loosely fixed on needle point F. By moving the operating lever D forward the air ports open and the pinion E is rotated against one of the retarding pins, causing the needle point to open simultaneously with the air port. Th
gine being started causes a suction which
the float valve G, in which is fixed a n
point, that rises with the float. The ga
now rises through passage H, passes
through ports I into flexible pan J.

Air is drawn through passage K, which
rounds reservoir B, and is deflected inw
by diaphragm L, and under flexible p
which is perforated sufficiently to allow
tain amount of the air to pass through
intermingle with the gasoline, but the g
body of air passes around the edges o
flexible pan J, which co-mingles with
richer mixture, and forms a highly exp
mixture in which state it passes alo
the engine.

When the engine is stopped the float
G settles down and automatically cu
the flow of gasoline.



The Kellogg Carburetor, Sectional View

The carburetor is operated with the
lever on the steering post. By movin
lever D forward more air is admitted
likewise more gasoline, and if the lev
pulled backwards the gasoline is not
turbed. The pinion being fixed loosely o
needle point allows it to run backwards
out turning the needle point unless it is d
far enough to engage the opposite pin,
the needle point will be turned simultane
with the closing of the air. If the dam
is moved forward when the pinion is a
return post, more air is admitted withou
creasing the supply of gasoline.

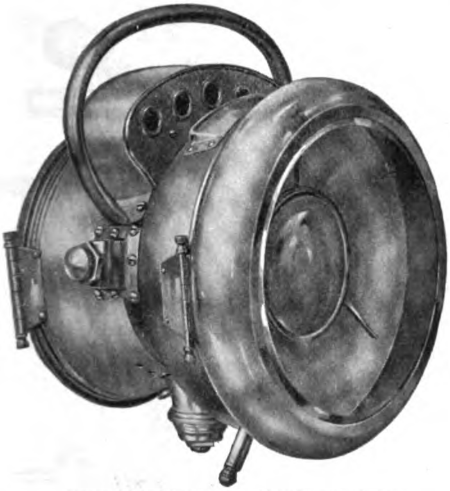
The cup damper is held in mesh with
by spring M. This is used only in th
itial adjustment. The damper may be
down and turned to either right or left b
engaging it with the pinion. Dirt or an
eign residuum may be drawn from the
voir by opening valve N. When once
erly adjusted this carburetor requires
adjustment.

SUNLYTE AUTO LAMPS

Four years experience in the Automobile supply trade has taught us a good deal about the business. We know that quality counts first and we want a chance to show you that "Sunlyte" Lamps and Generators and Motor Goods Mfg. Co. sundries will stand the hardest kind of usage.

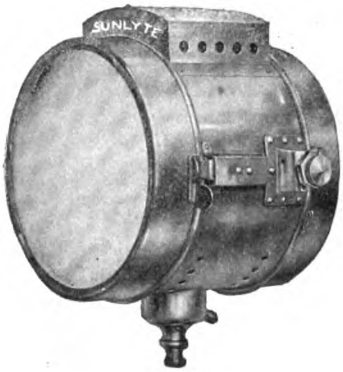
THE PRICES ARE RIGHT.

These goods are made exclusively for ourselves by an old established brass works and embody our ideas. We have made the selling prices low and solicit the business of jobbers and manufacturers.



FRENCH STYLE, LIST $15.00

It's the Parabola Style—the most popular Lamp in Paris—made in New York and sold at half the import price. Height 12 in., 10 in. front, weight 10 lbs., fitted with Bausch & Lomb condenser and silvered reflectors. The focus is accurate and it throws a powerful light.

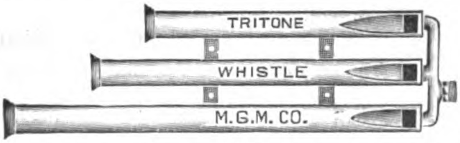


SEARCH LIGHT, LIST $10.00

Our 7½ in. Searchlight, being fitted with B. & L. Mangin reflector, correctly focused, gives a stronger light than 8 or 9 in. lamps with imitation reflectors. It is made of brass, the front door and rear cover of heavy copper. Supplied with swivel or pilot house attachment at a small extra cost.

TRITONE EXHAUST WHISTLE

Licensed under
patent No.
783,748



$12.00

This Whistle is made of heavy gauge brass tubing highly polished, in a thoroughly efficient manner. The Cut Out Valve is constructed on an absolutely mechanical principle allowing valve to be opened and closed gradually giving as loud or low a blast of whistle as may be required. Ready for immediate delivery.

NEW YORK SPORTING GOODS CO.

Selling Agents for MOTOR GOODS MFG. CO.

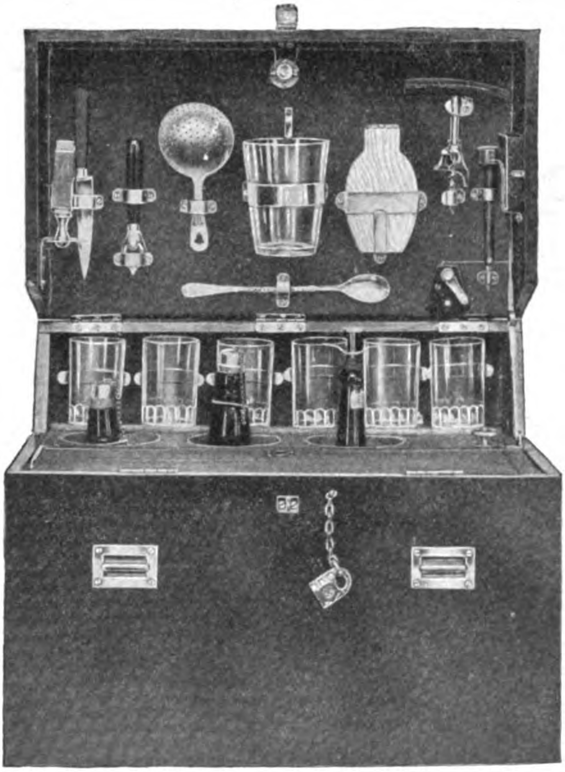
17 Warren Street - New York, U. S. A.

Madison Square Automobile Show, Stand 157

The "Auto-Buffet"

A portable buffet is being made by Wotherspoon Portable Buffet Co., 145 E. 42nd St., New York City, for automobilists.

This creation is unique, comprising a combination of a light, compact ice box and solid mahogany cafe top. The ice chamber is composed of a secret compound of great strength and considerable lightness which has wonderful cold insulating qualities. This compound is reinforced by the box lining, which is of basswood. The interior lining of the compound is tinned-copper, and the contents cannot leak or spill out. The ice box

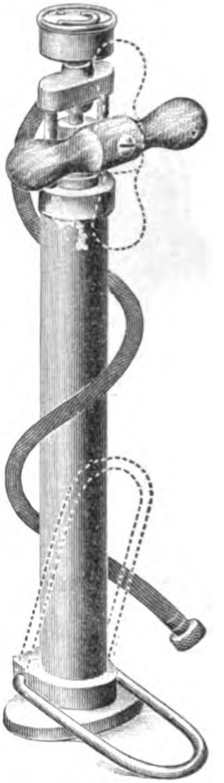


The "Auto-Buffet," Open.

is fitted with a specially designed interior drip valve, operated from above, which allows all waste water to flow off at will. The valve outlet is flush with sides. A brass apron prevents liquids from marring the exterior of the buffet. The ice box is sealed by a cover of solid mahogany, which operates on strong but light nickel hinges, and when open forms a rigid bar piece.

Another piece of the same wood, extending from this mahogany cover to the rear of the buffet, forms the opening of the bottle tubes and acts as a receptacle for the drinking glasses. The bottle holders consist of watertight tubes of light tinned sheet copper carefully fastened in position. The cover, which is lightly and strongly reinforced, does not hinge from the edge of the top but about two inches away from this point, which is generally its weakest place. The drinking glasses spond to that of the car.
are of selected Bohemian manufacture
cut bases. All of the interior fittin
carefully nickeled brass. The exte
fitted with strong, highly polished bras
dles, hasp, and a specially designed
lock. A feature is the brass fasten
front and back of buffet. The buffet
fastened by straps to the running bo
on other portions of the automobile.

The buffet can be easily carried i
hand, and its dimensions are (outside
urement) 16 ins. long, 15 ins. high a
ins. wide. From 20 to 30 lbs. of ice
carried. The exterior is finished to



The "Demo" Automobile Tire P

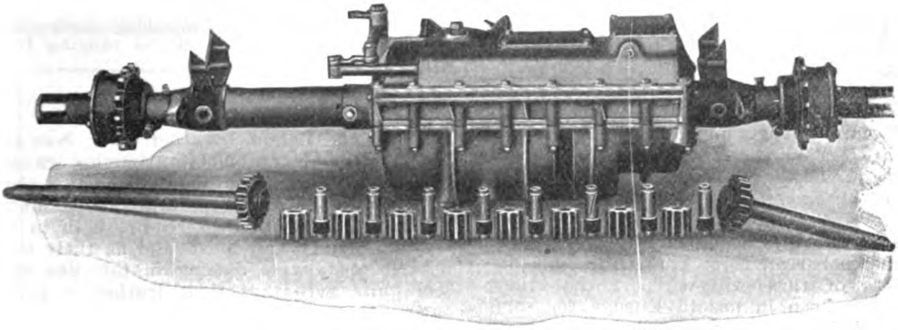
"Demo" Automobile Tire Pun

A new tire pump recently placed o
market by Bridgeport Brass Co., 253 I
way, New York, is the "Demo,"
herewith. This pump has a folding
and handle and is fitted with a pr
register which enables the user to kno
exact pressure on his tires and to pum
tires exactly to any required pressure, I
all four tires pumped up correspondingl
gauge is located at the top of the pum
being of the same diameter as the pum
not cause it to take up any extra room.
pump operates on both strokes, but de
of air to the tire is made on the up s
It is designed to operate without the ex
ture of undue exertion on the part o
operator and is made of highly polished
Price is $6 with gauge, $5 without.

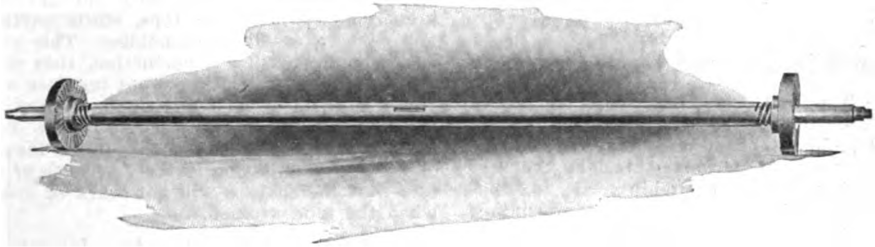
Safety, Simplicity, Economy, Luxury and Power Combined

HEDGELAND'S

Anti-Skid Solid Axle



THIS IS WHAT WE DISPENSE WITH



THIS IS WHAT WE PUT IN

Differentiates Without Gears

Has many advantages over the present form of differential gears. Both wheels are positively driven, and the driving axle is of one continuous piece, thus reducing friction, and adding strength. A car fitted with this device positively cannot slip or skid in starting or rounding a curve, or driving zig-zag on wet or muddy streets. Reduces strain on the car. Positive in action, and makes the use of anti-skidding devices unnecessary. It also greatly saves wear and tear on pneumatic tires. Drives the car squarely from the back, increasing engine efficiency, eliminating all side thrusts. It dispenses with any form of gear and the attendant friction and adds speed, because one wheel or the other is, inch for inch, getting the benefit of the full driving power of the engine. Sliding gear transmissions can be changed with gears idle.

Built of the best materials in three styles—runabouts, heavy touring cars and for jack shaft transmission. Guaranteed against defects for one year. Up-to-date manufacturers get in line; test this out for your 1906 cars.

WEBSTER MFG. CO.

SOLE MANUFACTURERS **1075 W. 15th St., Chicago, Illinois**

1906 Steel Studded Continental Tires

As the size and speed of automobiles has increased, so has the effort of the Continental Caoutchouc Company, of Hanover, Germany, to produce tires that would safely carry the largest cars at the highest speed. Their latest production is the "Steel-studded Continental Tire," a non-skidding tire which is constructed entirely without leather.

All studded (anti-skidding) tires have heretofore been constructed partly of leather, either being covered over with leather or having a strip of leather set into the tread, into which the studs are fastened.

The new "Steel-studded Continental Tire" is a heavy tire especially constructed with heavy walls and tread. Over this is built an extra heavy tread with many layers of the strongest Egyptian cotton canvas, which protect the carcass of the cover and the inner tube from the steel studs, which are firmly held in place by being vulcanized into the mass of material of which this outer tread is constructed. These tires, being extra heavy and strong, and being "Anti-skid," are safe for slippery streets, asphalt, etc., and are already in use on many of the better class of automobiles in New York and elsewhere.

The Continental Caoutchouc Company, of 43 Warren Street, New York, American distributors of these tires, report that these tires have been in use in Europe for some time and have shown excellent results in racing and touring events.

Automobile Top and Cover Company

Auto Top & Cover Co., 148 W 56th St., New York City, are manufacturing a line of automobile tops, slip covers, etc. Their tops are made of various materials, the first grade being in imported whip cords, mackintosh and khaki cloth with rubber interlining; 2nd grade hand buffed leather; 3rd grade, standard U. S. khaki cloth; 4th grade, imitation leather or pantasote with whipcord lining. Curtains rear and side, storm boot, front and back straps are included. Curtains and boot have extra large celluloid lights fitted. The storm curtains enclose the entire car, giving perfect protection from the elements. The brackets used are drop steel forgings and the bows are second-growth oak and ash. All bows are crowned 3 inches. Bow sockets are double reinforced steel tubes. The bows are covered with hand-buffed patent or russet leather. The linings of the better grades are of the finest quality broad cloth. Being padded with the best quality curled hair the top will not sag.

Their slip covers are made of various suitable fabrics and in colors to match all cars.

Geo. Heinlein, Parsons Avenue and Deshler Street, Columbus, Ohio, is commencing the manufacture of automobile bodies, and while his business as yet is mostly local he will later branch out more extensively.

"Union" Automobile Bows

Union Auto Bow Co., 190 Superior s
Cleveland, Ohio, manufacture a complet
of vehicle bows including bows of va
types for automobile tops. They mai
three factories, and the one handling
heavy bow business is turning out 300
of automobile bows per week, which
cates what a large business they are wo
up in this trade. They find the tenden
toward the use of short bows in conne
with wish-bone sockets. In short bows
offer several stock sizes in sets of 4, eac
in separate bundle, prices ranging from
per set for ¾x1½-inch bows to $1.60 pe
for 1x1½-inch bows. These bows are
from 8-foot stock. Where over 5-ft.
bows are wanted the prices are 30 per
and higher per set.

They also have long bows bent from 1
stock, 4 bows to the set, prices ranging
$1.60 to $2 per set.

American Patent Leather Co., New
N. J., who make automobile trimming leat
use nothing but choice hides and finish t
with a view to giving the automobile ma
facturers just what they require both in
way of quality and finish and as their b
ness is steadily increasing in this line
feel quite sure that their leather is gi
entire satisfaction.

Hodgman Rubber Company, 806-808 Br
way, New York, are putting out speci
prepared cloth for cape tops, storm curt
and seat covers for automobiles. This c
is of double texture construction, that is
say, two pieces of cloth are put together v
pieces of rubber between which renders
fabric perfectly water proof. It has b
found advantageous to use this fabric inst
of leather or imitation leather, because of
fact that the surface will not crack or cre
when the top is folded.

Salisbury Wheel & Mfg. Co., Jamesto
N. Y., have installed machinery to ena
them to manufacture any type of front a
for pleasure automobiles and both fr
and rear axles for trucks. On their fr
axles they used Strieby & Foote and Billi
& Spencer forgings for spindles and yok
They have a number of big contracts on th
books and are in a position to take on a f
more. This concern has found it necess
to twice make additions to their factory d
ing the past year.

The Winkley Manufacturing Compa
Hartford, Conn., will be located at Detr
Mich., after January 1, 1906. Besides th
line of oiling devices, etc., they recently
quired the manufacture of the Garllus carb
retor and the Eureka separator. As their n
location is in the automobile manufacturi
centre and they have much larger faciliti
both as to floor space and equipment, th
will be enabled to do business on a larg
scale and to meet the ever increasing d
mand for their goods. Their new addre
is P. O. Box 243.

The Automobile Supply Company

1339 Michigan Blvd. Chicago, Ill.

Headquarters for all kinds of Supplies and Accessories

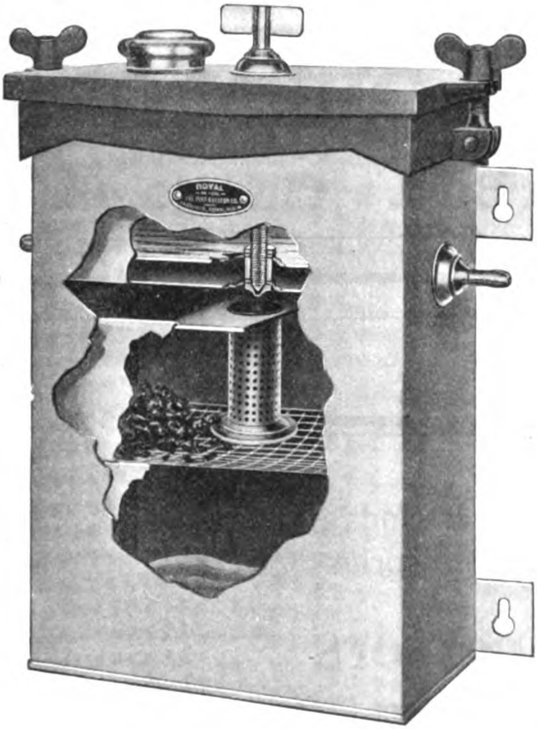
Importers
Jobbers
Dealers

Official Station of the American Motor League

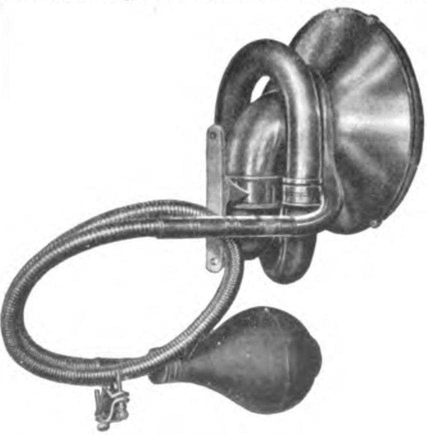
Send for Our Catalogue

Post & Lester Co.'s 1906 Specialties

The 1906 lines of the Post & Lester Co., of Hartford, Conn., include new models of the famous Volier French horns, Royal De Luxe lamps and generators at attractive prices, Immunity armored ignition cable, novelty clocks which will be shown for the first time at their Garden Show exhibit, the new Duray goggles, volt and ammeters of improved pattern, Neverskip and Surespark plugs, and imported E. I. C. coils and ignition outfits, together with all of the standard automobile goods.



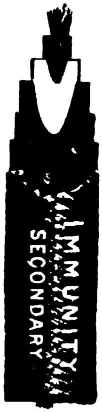
Royal De Luxe 1906 Generator.



The New "Monstre" Horn.

The new "Monstre" horn offered to jobbers, dealers and owners gives a deep, warning sound, said to resemble the magnifie prolonged voice of a bull-frog, and wh very effective in clearing the road. It h 8-in. bell, and sells complete with f tube for $11.00.

Immunity cable gets its name beca offers "immunity" from cable trouble having a special, tough composition which is designed to keep effective th gum rubber insulation, by protecting it heat, chafing and oil. This cable i being used as equipment by Ramble other prominent cars. It is 20c. a fo the secondary and 12c. a foot for th mary.



Section of "Immunity" Cable.

For several months samples of the Royal De Luxe grate generators have out on test, with remarkable results a ing to the Post & Lester Co. These g tors are offered as sure and satisfacto givers, easily cleaned and very economi carbide. The price is $12.00.

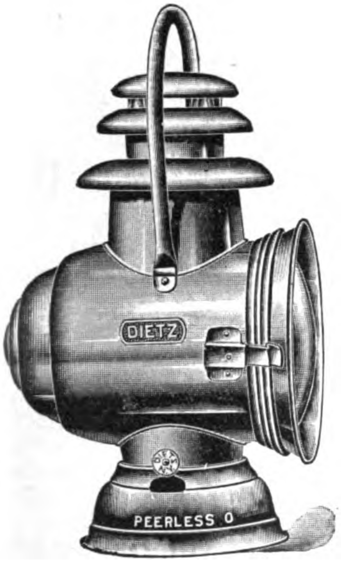
This issue is sold for 50c. a copy. next issue will be a triple show n which is worth almost as much. The number of the CYCLE & AUTOMO TRADE JOURNAL will be a complete cle number in which an illustration a scription of every car on the Am market will be printed, arranged com for comparison and reference. Ther many other special numbers throughou year, in addition to the large amount o ter contained in our regular numbers. will do well to subscribe immediately. scription price is $1.00 per year. Blan be found on page 444.

DIETZ

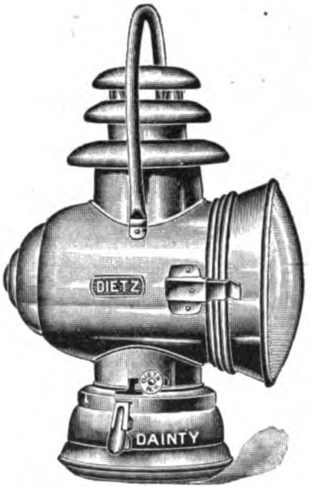
Oil Lamps for 1906

Ahead of all others for convenience,
strength and reliability.

Two styles for Runabouts



Peerless O
List $5.50 each



Dainty Side
List $5.50 each

All DIETZ LAMPS stay alight

You can get higher priced Lamps for Runabout equipment but **nothing better.**

The **DAINTY SIDE** is a beautiful little Lamp and most suitable for small runabouts.

R. E. DIETZ CO.

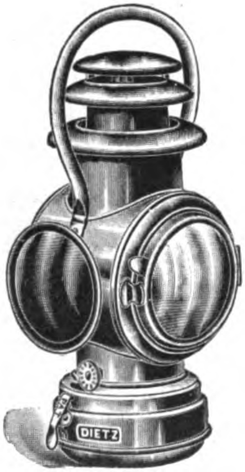
35 Laight Street *New York, U. S. A.*

ESTABLISHED 1840

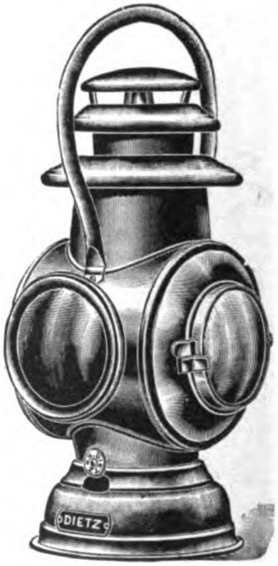
DIETZ

Oil Lamps for 1906

Two Desirable Tail Lamps



Dainty Tail
List $6.50 each



Dietz No. 2 Tail Lamp
List $7.00 each

All DIETZ LAMPS stay alight

After being two years on the market, we believe the **DAINT TAIL LAMP** to be the best small Tail Lamp on the market.

R. E. DIETZ CO.

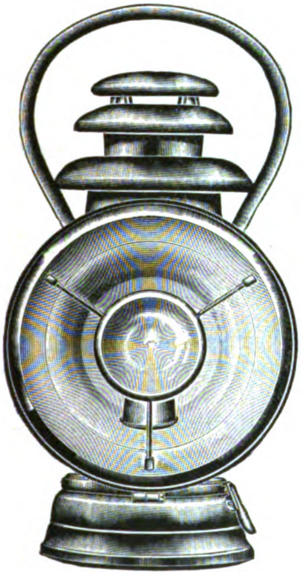
35 LAIGHT STREET NEW YORK, U. S. A

ESTABLISHED 1840

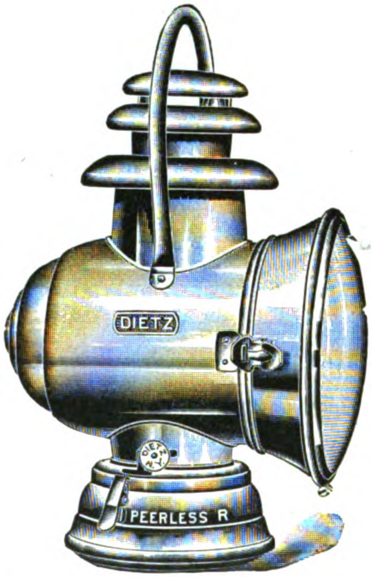
DIETZ

Oil Lamps for 1906

The highest grade Lamps in material,
workmanship and style.



Peerless R with Plano-Convex Lens
List $9.00 each



Peerless R
List $7.00

All DIETZ LAMPS stay alight

Your Touring Car lacks something if not equipped
with these Lamps.

R. E. DIETZ CO.

35 LAIGHT STREET NEW YORK, U. S. A.

ESTABLISHED 1840

VESTA

SPARKING BATTER

PATENTED

NO

CORROSION

AT

TERMINAL

GUARANT

FOR

ONE

YEAR

This Cut represents our 6 Volt 60 Ampere hour Battery.

This battery is made with great care, securely packe
hard wood. There is no free acid to run out or spill. It
be shipped anywhere fully charged ready for use.

STANDARD SIZES

IN INCHES

4 Volt	60 Amp. hour,	9½ long,	3⅞ wide,	8½ high,	Price **$18.00**,	weight 23	poun
6 "	60 "	" 9½	" 5½	" 8½	" "	**27.00**,	" 33	"
8 "	60 "	" 9½	" 7	" 8½	" "	**36.00**,	" 42	"

**SATISFACTION GUARANTEED OR MON
REFUNDED**

Send for descriptive lists

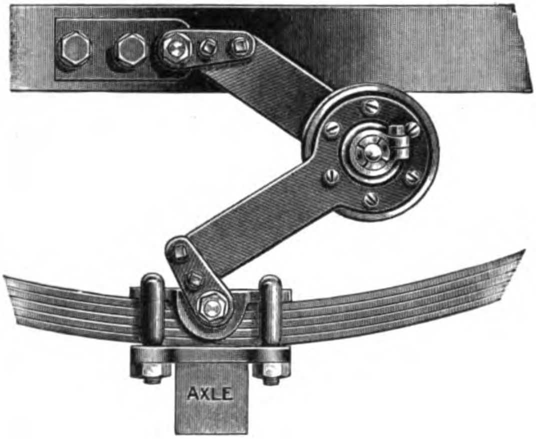
MANUFACTURED BY

VESTA ACCUMULATOR C

1336 Michigan Ave., Chicago

Truffault-Hartford

SUSPENSION



Will run 5,000 miles without adjustment. Requires but fifteen seconds to readjust all four suspensions.

RACING BOARD
OF THE
AMERICAN AUTOMOBILE ASSOCIATION

September 11th, 1905

Hartford Suspension Company,
No. 67 Vestry Street, New York City.

Gentlemen:

In reply to your inquiry in regard to the success of your suspensions on my 40-45 h. p. Locomobile, it gives me great pleasure to be able to heartily endorse them. In the past five years it was my common experience to break from three to five springs during the Summer, but this season, with your suspension I have toured over five thousand miles without breaking a single spring. I am rather a hard driver and when you consider that my car weighs 3,500 lbs. empty and that my touring has been over the White Mountains, the Fiskill Mountains, the Catskill Mountains and the Adirondack Mountains I think my opinion of your suspensions is amply justified.

Yours very truly,

RLM. ROBERT LEE MORRELL

Enables cars to proceed at highest speed over all obstructions
Doubles the life of the tires
Prevents lost traction

Increases the speed
Absolutely prevents breaking of springs
Endorsed by all the prominent Engineers

$40 and $60 **Immediate Deliveries**

HARTFORD SUSPENSION CO.

Edward V. Hartford, President **67 Vestry Street, New York City**

The Kimball Steel Tire Case

C. E. Kimball Tire Case Co., 173 Broadway, Council Bluffs, Ia., is making puncture-proof tire protectors, which also prevent skidding. A 32-inch tire case has about 50 bands or 400 pieces of flat steel links ⅛ in. thick and 2 in. wide at the tread. There are two tread plates to each band and they are corrugated. The plates or sections are fastened together by means of small calks, one on the upper end of each plate, which protrude through a hole in the lower end of each plate, thus serving as a non-skidding device. These bands are hooked to the rim or fastened the same as the tire. When used on crescent rims it is necessary to punch flat holes in the edge of the rim, so the links will hook into them.

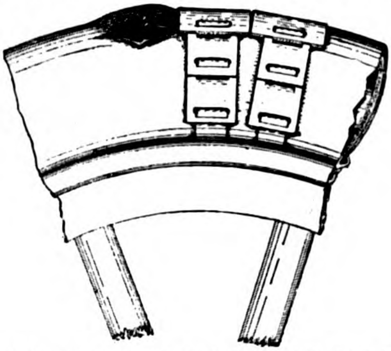
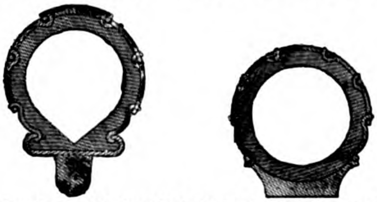


Illustration of two sections of the Kimball Steel Tire Case.



Sectional view of the Kimball Steel Tire Case on both clincher and crescent rims.

Sections or bands of the Kimball steel tire case can be purchased separately and will serve admirably to clasp over "blow-outs."

The prices range from $13.25 for a 26x3 inch tire to $33.75 for a 36x4½ inch tire, and single bands from 50 cents to $1.00.

The Sunlyte Generator

New York Sporting Goods Co., 17 Warren Street, New York, selling agents for "Sunlyte" automobile accessories are offering the manufacturing and jobbing trade the new generator shown herewith. This generator is made of heavy gauge brass in a thoroughly efficient manner. It embodies the automatic shut off feature and is provided with cut out valve as well. Double way gas cocks are fitted and a screen carbide basket, permitting the used carbide to sift through to the ash can beneath, which can is removable, enabling one to clean the generator without removing it from the car. It holds two pounds of carbide but will work perfectly with only one-half pound. It is six
diameter by nine incnes high and
with brackets to attach to car.
price is $15.

They are also marketing a t
bracket brought out especially to
demand for an inexpensive article

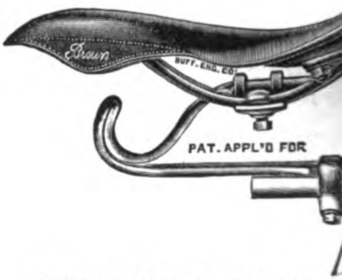
"Sunlyte" Generator.

N. Y. S
Tail Lan

kind. It is of solid brass and h
prop which fits practically all ta
This bracket is neat in appeara
made, strong and finely finished, an
state, furnished at a price below
would cost the automombile maker
them out in his own factory. I
deliveries can be made.

The "Simplex" Spring Saddle

The Simplex spring saddle suppo
cycles and motor cycles is made b
Errick, North Tonawanda, N. Y.,
simple, cheap, anti-friction and n
tory device of much merit. It ca
tached to any bicycle, fitting all

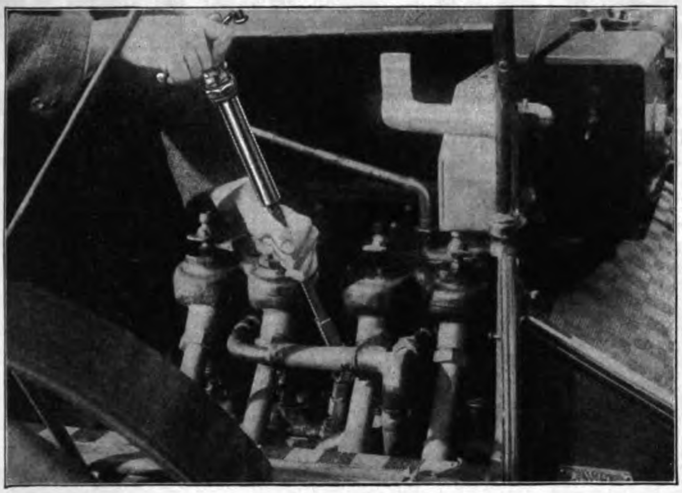


The "Simplex" Spring Saddle Suppo

seat-posts and by shifting the sa
tension can be adjusted to suit a rid
weight. The Simplex spring abs
jolts, bumps and shocks, thus perfor
functions of a spring or cushion f
though an inexpensive device requ
change in the ordinary bicycle to at
inch diameters.

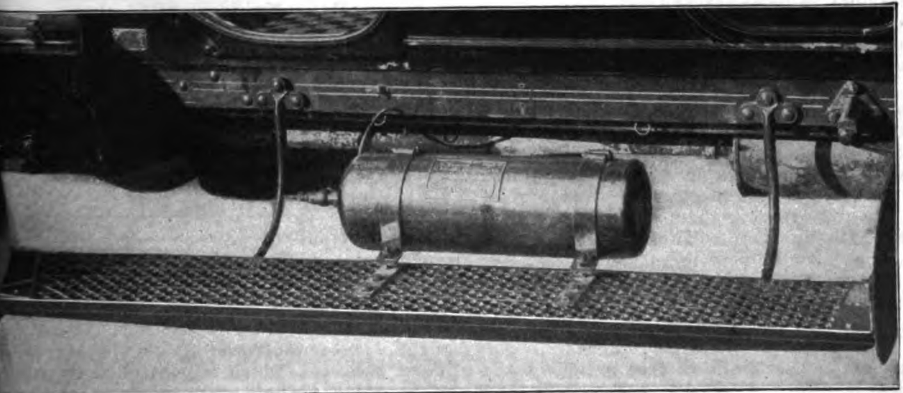
Springfield Automobile Top and
tery Company, of Springfield, Mass.
moved from 74 Harrison Avenue t
Dwight Street.

How would you do this on the road without



THE AUTO-CLE WRENCH

How much better will your new car look if fitted with



STANWOOD AUTO STEPS

Why not ask for them
Many manufacturers now furnish them

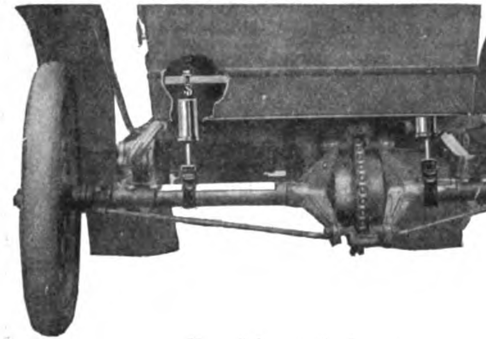
Manufactured by

RAILWAY APPLIANCES COMPANY
1160 Old Colony Bldg., Chicago

See our Exhibits { 69th Regiment Armory, Room E
Madison Sq. Garden, Space 207

"House" Spring Recoil Check

A number of devices are now on the market for the purpose of absorbing road shocks which the regular springs of the car cannot take care of, from the fact that the spring which is strong enough to absorb severe shocks is too stiff to give the necessary resilience in ordinary roads. These different shock absorbers are designed on various lines. A new one recently brought out by the Baldwin Chain & Mfg. Co., of Worcester, Mass., called the House Spring Recoil Check, is designed on the theory that the spring should be made long and elastic and that excessive shocks should be taken care of by controlling the upward movement of the springs. With this idea in view they have brought out this device, which they claim has proven entirely satisfactory in most severe tests.



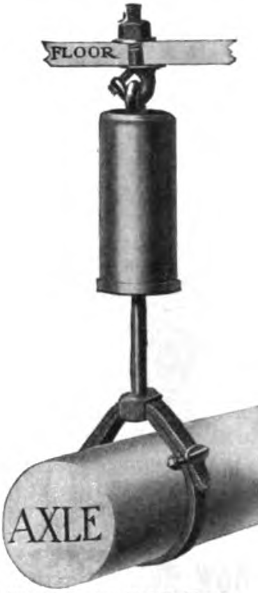
"House" Recoil Check on Car

Its construction is of the most simple form of an automatic grip. A simple steel shell or round case, with a supporting eye on the top, is hooked to the floor or frame of the automobile body. Inside this case is a divided piston covered with oil-treated leather, which contacts with the sides of the hollow steel cylinder, a set of toggle arms butt against each side of the piston segments and a yoke over the top drawing them down is attached to the axle by strap. Thus when the jerk upon the yoke bolt is increased in velocity the friction upon the sides is multiplied by the square of the velocity. Springs in the cylinder return the piston to its normal position after every action of the checks.

This recoil check allows free action of the springs in the compression movements and simply controls the quick, upward rebound. When moving slowly its action seems perfectly free, not in the least retarding the gentle movement of the springs. It throws no extra load or work on the pneumatic tires, yet renders it possible to use very elastic, resilient springs.

The check is unique and the action perfectly automatic without the use of air, oil or friction clamps; will work under all conceivable conditions and requires no oiling or adjusting. Its attachment to the body and axle of the car is easily made, and so flexibly arranged that any oscillation or lateral movement of the car cannot strain or break its parts.

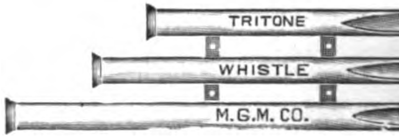
The action is also such that the springs can be compressed by the load, but cannot separate quickly. Being entirely automatic in its action, a moderately slow mo does not cause an increased resistan a quick movement or jerk causes the enclosed in the cylinder to expand an the action of the springs in propor the velocity.



House Patent Spring Recoil Check.

The Tritone Whistle

New York Sporting Goods Compa Warren St., New York, selling agents Motor Goods Mfg. Company, are ma a new whistle called the "Tritone," wh its name indicates, gives three tones of This whistle can be attached to any the car, but is usually placed at th above the running board. It is blown haust pressure, which is controlled by of a pedal. The construction is of gauge brass tubing, highly polished. T out valve used is well constructed and the operator to vary the tone of th over a very wide range. The "Trito of course, also suitable for marine use. is $15.00.



The Tritone Whistle.

W. E. Brouse & Co., 47 Vincent Cleveland, Ohio, manufactures fine to windshields for all makes of cars, in intosh, chase leather, pantasote, leat and various grades of leathers. The are adapted to the various machines well and always keep their shape. goods are all made by skilled workm from the best material.

The triple show number to be issued Feb will be another record breaker. Don't miss i in your subscription promptly on blank y find on page 444.

RADIATORS

We claim to manufacture the best radiator made in this country at the present time.

This may seem like an extravagant claim but it can be fully substantiated by examination and test. They are high grade in every respect.

We make cellular, also flat tube radiators of several designs, all fully covered by patents.

Why not investigate our radiator before placing your order for 1906?

We guarantee better efficiencies than any other company existing.

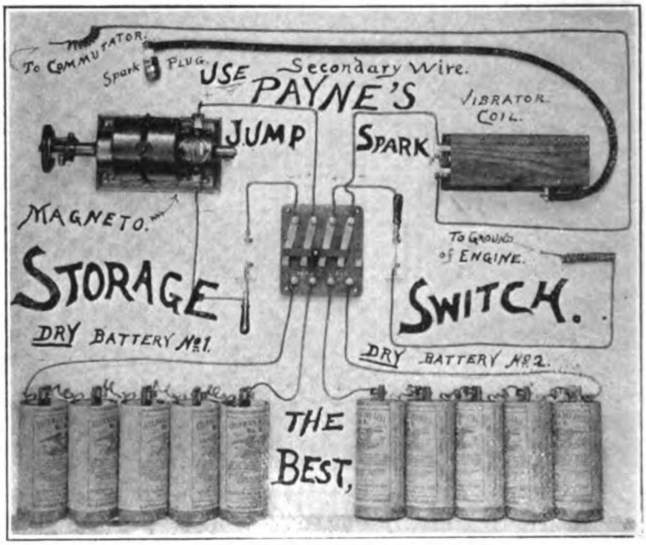
Write for further information.

THE MAYO RADIATOR CO.

STATE and MILL RIVER STS. NEW HAVEN, CONN.

The Payne Dry Battery Storage Switch

J. W. Payne Switch Co., of Alexandria Bay, N. Y., have brought out a switch for the ignition system of hydrocarbon motors which he calls the Dry Battery Storage Switch. Mr. J. W. Payne has been in the gas engine business for fifteen years as an all-round repair man and has found that a large majority of the difficulties in the running of a gas engine are caused by lack of electrical energy delivered at the sparking point, or in other words, a lack of ampereage, usually corrected by the addition of more dry cells, a practice he claims is wrong, as it is increased amperage that is needed, and this can be obtained, he states, by the use of his storage switch.



The Payne Dry Battery Storage Switch.

The object of his switch is to enable one to use a magneto or dynamo to furnish the ignition current in connection with a jump spark igniter so that it will work positively and not injure the sparking mechanism. Although this can be accomplished by the use of a storage battery, the magneto or dynamo being governed so as not to overcharge the battery. But as the storage battery is more expensive to instal than dry cells it is an advantage to be able to use dry cells for starting the motor and the mechanical generator to keep it going afterward.

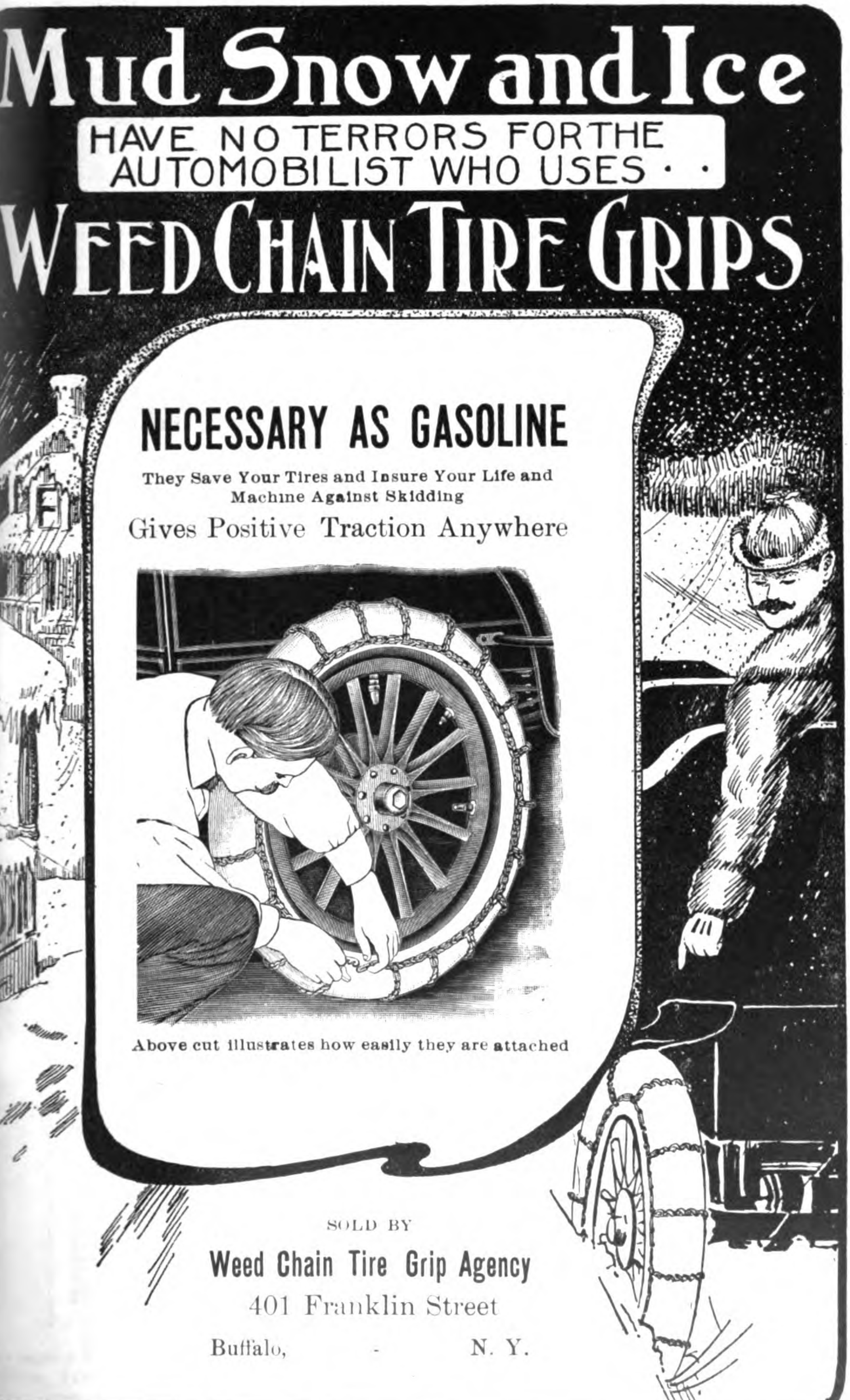
In the Payne system two sets of dry cells are used, one set consisting of four large size Columbia cells and the other of five small size Columbia cells. The switch will, however, operate successfully with any reliable dry battery. The ampereage of the current delivered to the sparking point is increased and kept up by the Payne switch, the secret of this accomplishment lying in the construction and operation of the switch. The device lists at $3, and full instructions for installing are sent with each.

"Autoline" Oils

Wm. C. Robinson Oil Co., 336-3
street, Baltimore, Md., are putting
of automobile lubricating oils under
istered trade name "Autoline." "
No. 1 is recommended for use on st
No. 2 for winter use on high speed
air-cooled cars; No. 3 for air-cooled
ly water-cooled cars; No. 4 for wa
cars; No. 5 for external bearings. T
manufacture a high grade pure g
use in compression cups, on open
and in gear cases. This journal
is put up in 5, 10, 25 and 50 lb. can
barrels and barrels.

"Autoline" oils are put up in n
graphed cans of convenient size, 1
lon cans to a case, 1 and 2 five-ga
cased, half barrels and barrels. T
guaranteed not to carbonize in the
not to gum and not to contain any
substances. This company has br
a number of cities, where full stoc
ways kept and from whence immedi
eries can be made.

Philadelphia Grease, manufacture
Philadelphia Grease Mfg. Co., The
Philadelphia, Pa., for automobile
boats, etc., it is claimed does not
become rancid, crust over or gum
improves by age. Little grease is
to perform the necessary work an
not melt to lubricate but forms a t
ing over the bearing thereby el
dripping. Their No. X is especially
for the hot parts of the motor.
to a chemist's report from the
Polytechnic School, Philadelphia
free from grit, mineral acids, dirt
graphite, does not soften below 19
Fahrenheit, and retains its body at
higher temperature.



Mud Snow and Ice

HAVE NO TERRORS FOR THE AUTOMOBILIST WHO USES . .

WEED CHAIN TIRE GRIPS

NECESSARY AS GASOLINE

They Save Your Tires and Insure Your Life and Machine Against Skidding

Gives Positive Traction Anywhere

Above cut illustrates how easily they are attached

SOLD BY

Weed Chain Tire Grip Agency

401 Franklin Street

Buffalo, - N. Y.

"Rich Spark" Plug

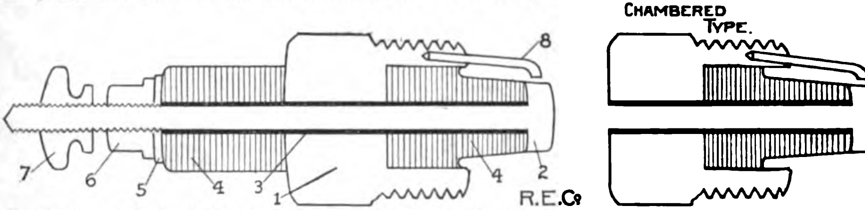
Richardson Engineering Co., 36 Pearl St., Hartford, Conn., have brought out a new spark plug called the "Rich Spark," cuts of which are shown herewith. This plug is composed of very few parts. Insulation is double and the plug is so constructed that it cannot blow out. The pressure from the cylinder only tends to make the insulation tighter.

RICHARDSON ENGINEERING Co HARTFORD, CONN.
RICH SPARK

"Rich Spark" Plug.

While the plug is partly chambered, the insulation projects out far enough to allow easy cleaning and to get the spark well into the cylinder. No shellac is used in any part of the plug. The mica is finely polished and retains its finish.

The plug is put out in several types, the ordinary ½ in. iron pipe size listing at 75 cents, the metric thread plug at 80 cents. Special plugs are put out for the Rambler at 80 cents, the Winton 85 cents, Ford 85 cents, Autocar 90 cents.



Sectional cut of the "Rich Spark" plug. 1, Brass Shell; 2, Firing Pin, steel; 3, Best India sheet mi wrapped carefully around 2; 4, Best mica discs fit around 3 closely and forced together under gr pressure; 5, Copper washer; 6, Brass nut to keep mica in place; 7, Thumb screw for wire or termin 8, Spark pin, special non-corrosive alloy.

A pair of these plugs after 2000 miles' use in a Winton touring car are still giving thorough satisfaction and have not caused the slightest trouble.

Teel Wind Shield, Tire Tools and Other Specialties

E. Teel & Company, Medford, Mass., are now putting out a wind shield or front with celluloid window. They have found that a great many customers object to glass fronts on account of the danger of breaking. Teel & Company claim for the celluloid front the absence of danger from breakage, light weight and the fact that it can be rolled up on the dash and the standards folded down. This entirely removes the front, which is ready for instantaneous replacing and when it is rolled up it presents a neat appearance. In raising and lowering the front there are no bolts to loosen, and this result can be accomplished in about two minutes.

They are also putting out tire irons made of a cast composition which is very light and strong.

Their line also includes seat covers made of a variety of cloths of different grades, all covers being bound and finished very neatly.

Among their fittings is also included a ing trunk rack which is very light and s and has joints on each side so that wh is down it is impossible for any joh

Teel Wind Shield.

throw it up. They also furnish trunk s if desired.

All these articles they are carrying in for all principal 1906 cars.

This concern has also brought out a cover which is constructed with two wires that hold the flaps in place, ar each flap covers the open part of the and fits very tightly against the tire, it m a cover which is entirely proof against

Teel Tire Cover.

or dirt. As there are no lacings or str loosen or fasten, this cover is very taken off or put on and makes a very case when on.

FACTS

About Ball Retainers;

and particularly about the BEST ball retainers

I. The **SARTUS** is the **original**, one-piece three point contact retainer.

II. The **SARTUS** is the **lightest** retainer ever produced.

III. The **SARTUS** is made to **fit all sizes and styles** of modern ball bearings.

IV. The **SARTUS** is the **most accurately constructed** retainer on the market.

V. The **SARTUS** retainer can be filled with balls (by the Sartus filling machine) more rapidly than any other retainer.

VI. The **SARTUS** retainer eliminates **all** rubbing friction.

VII. The **SARTUS** is the **cheapest** as well as the **best** retainer.

VIII. The **SARTUS** retainer is made under U. S. Patents, 765,500; 611,689, and 799,008, which cover all one-piece three point contact retainers consisting of a ring-shaped base and standards forming spaces to receive balls.

IX. All ball retainers (except the Sartus) "having a ring-shaped base and standards rising at one margin only" infringe Patent 799,008 and users are liable to suit for infringement.

X. You can not afford to use any retainer but the **SARTUS** in 1906.

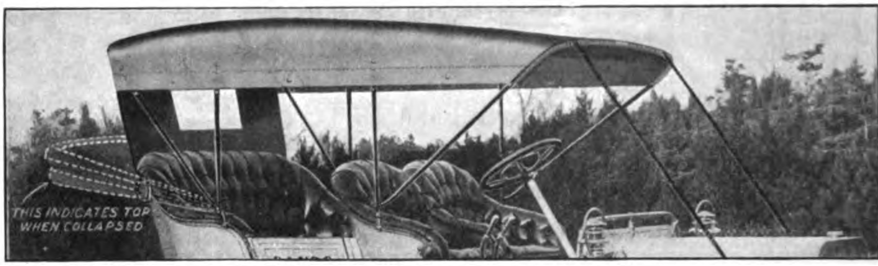
ESTABLISHED 1896

The Sartus Ball Bearing Co.

155 Spring Street, NEW YORK CITY

C. P. & R. Auto Tops and Trimmings

The Coleman, Prouty & Root Mfg. Co., Detroit, Mich., have remodeled their factory and equipped it with everything necessary for the production of high-grade automobile tops. They have skilled and experienced men and use the best of material obtainable. Eight different types of tops are put out by this concern. Their No. 1 joint top with wind shield has wooden bows made from selected white ash or second growth oak with rounded edges; leather covered, reinforced steel sockets curved to suit different style bodies; best steel drop forged irons, hand fitted and curved design joints highly finished in polished brass. Seat forgings are of best steel with taper sockets and extend to bottom of seats, bolting top and bottom. Their own design goose neck and eye are used with ¾-inch taper ends fitting into taper socket and locked. They are polished, japanned or brass plated. The prop nuts are of Landau pattern. Trimmings are in heavy Egnlish waterproof 3-ply Mackintosh cloth, pure gum rubber in center or in Pantasote colored leather. Side and back curtains are of the same material as the top. Lining is Pongee Silk or worsted and back quarter quilted with silk thread to match. The No. 2 joint top is the same as No. 1 excepting that sockets and joints are finished in japan and the trimmings are Fabrikoid or T. T. Drill with side and back curtains to match and Broadcloth or worsted lining. No. 3 joint top is trimmed in Moroccoline on T. T. Drill. No. 4 is a strap top, same as No. 3 except that the prop nuts are of special pattern and the straps are double creased, of fine stock with rubbed edges in either tan or black with brass buckles and snaps. Nos. 1, 2, 3 and 4 joint tops can be furnished with storm fronts and Nos. 1, 2 and 3 with wind shield. No. 5, a full Goddard top, has bow irons of the finest quality steel, hand forged and fitted. Seat forgings are also hand forged and fitted. Joints are curved "Victoria" design, japanned. Trimming is in hand buffed leather, 30-oz. rubber or Pantasote leather and heavy English broadcloth or Pongee silk linings are used. Nos. 6, 3 or 4 bow top has heavy steel leather covered or japanned sockets; curved design joints and special pattern prop nuts. Trimmings are deep buffed leather, 28-oz. rubber Fabrikoid or T. T. Drill, lined with heavy broadcloth. No. 7, a canopy top, has a head li of tan-colored mackintosh covering the e rib work. Framework is made of s white ash in natural or mahogany fi The deck is covered with heavy waterp tarpaulin colored to match the shade of curtains. Stationary or detachable curt are provided, bound and reinforced at edges. Standards are made of ¾ h brass tubing. Rattle and vibration are vented by the taper ends fitting into t sockets. Special double lock nuts fasten standards to the seat forgings. Curtain teners are polished brass. The cu straps are double pattern, embossed r leather, easily detached. A substan highly polished baggage rail is furni extra, either single or double with h brass scroll ends and feet.

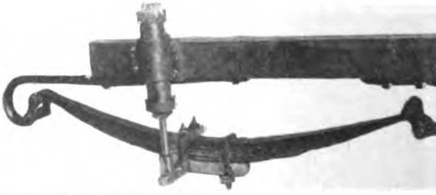


C. P. & R. Automobile Top.

The "Perfection" Air Cushion

The "Perfection" air cushion is a shock sorbing device for automobiles and is product of Sheddan Air Cushion Co., 13 Fayette Street, Baltimore, Md. It con simply of an air chamber and a piston with a double acting piston head. Th chamber can be attached to any part o body of a vehicle or to the upper half full elliptical spring, and the piston ro any part of the axle or any fixed point b or to the lower half of the full ellip spring.

When the car drops into a rut or gutt place of its going down with a sudden it is eased down by the air chamber b forced down on the piston. When the comes up out of the rut or gutter or on t obstruction like a railroad track it is ease on an air cushion by the reverse actio the piston in the air chamber, thus there no jolts and there is no strain on the chine by either the sudden upward or d ward stroke, as both movements are pletely eased up by the compression in air chamber.



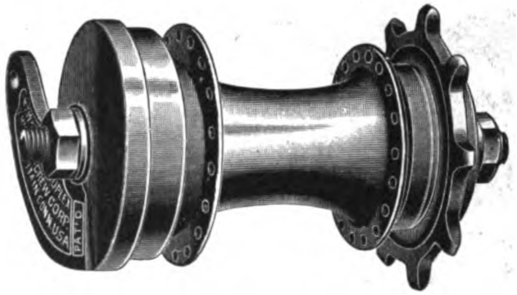
The "Perfection" Air Cushion Shock Absorbe

The "Perfection Air Cushion" is comp of few parts and can be attached to make of machine.

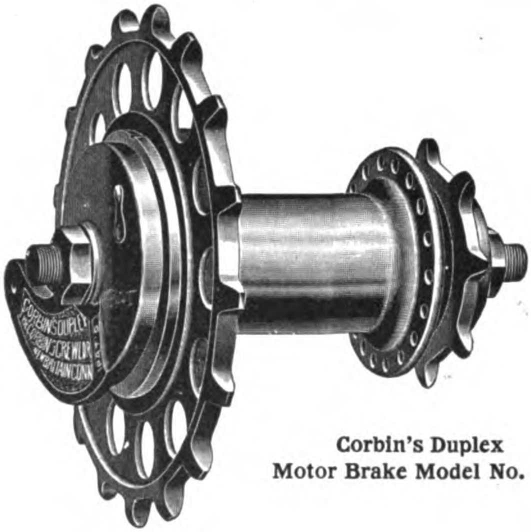
CORBIN'S DUPLEX

NEW DEPARTURE

COASTER BRAKE



Corbin's Duplex Coaster Brake, Model No. 6


CORBIN'S DUPLEX
THE CORBIN SCREW CORP
NEW BRITAIN CONN

Corbin's Duplex
Motor Brake Model No. 5 B

Our line is now complete and we are prepared to furnish brakes for any wheel or motor cycle on the market.

Our 1906 Catalogue will be ready Jan. 1st.

The Corbin Screw Corporation

NEW BRITAIN, CONN.

"Reeves" Variable Speed Transmission for Mechanisms of all Kinds

Reeves Pulley Co., Columbus, Ind., are calling the attention of manufacturers in the automobile trade to the merits of the "Reeves" variable speed transmission, which gives any desired ratio of speed within its limits and a strong drive. Tersely it may be stated the "Reeves" transmission is simply an improved form of variable speed counter shaft.

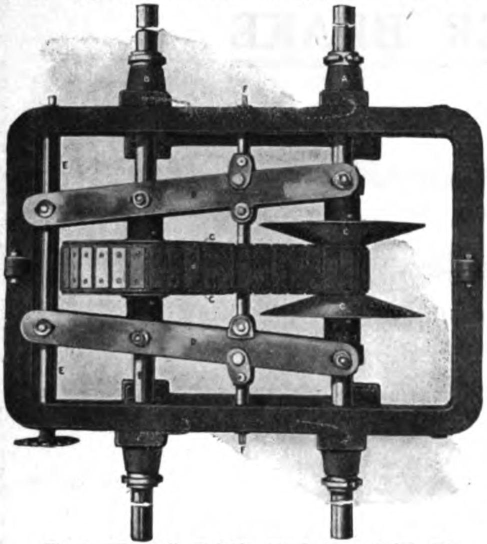


Fig. 1. "Reeves" variable speed transmission set for minimum speed.

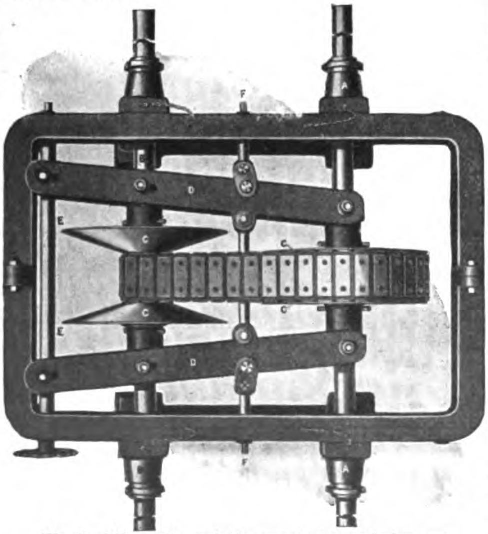


Fig. 2. "Reeves" variable speed transmission set for maximum speed.

Referring to cut it will be seen that the conspicuous features are two sets of cone discs (C), spline-mounted on two parallel shafts (A and B). (A) is the driving shaft and (B) the driven. One disc of each set is attached to a peculiarly pivoted bar (D) which bar is operated by a screw (E) in such manner as to bring together one set of discs as th
set is forced apart, the combination
and pivots being such as to preserve
stantially uniform tension of belt. T
formity of tension is of the utmost
ance and secures the perfect operation
device. A take-up screw (F) is prov
adjust the tension of the discs.

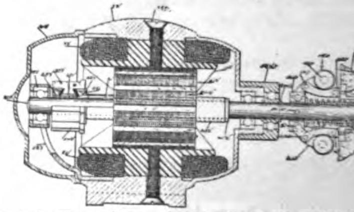
The inner sides of these discs form
shaped groove in which is fitted an es
designed belt, having its tractional
on the edges instead of the bottom, a
ordinary belt.

The operation is very simple. One
discs acts as driver, the other as drive
the driving circumference of one is in
the other is decreased; the power is
mitted and the variation anything wit
compass of the two extremes.

This transmission should be of pa
interest to users of iron working too
as planers, lathes, milling machines,
mills, etc., where variable speed is nec
It is furnished in different sizes cap
transmitting 2 to 150 horse power.

Features of the 1906 Apple St Battery Charger

The sectional view herewith gives
cellent idea of the construction of the
Storage Battery Charger, of which w
been able to show only an exterio
heretofore. This charger is a dynamo
well-known Apple type, completely e
and is a little larger than the old style
ignition dynamo. It gives a three
charging rate on an 8 volt battery a
R. P. M., on a 6 volt battery at 1
P. M., and on a 4 volt battery a
R. P. M. It can be driven by belt,
or gears, as desired. The discs of the
cal iron are japanned and then s

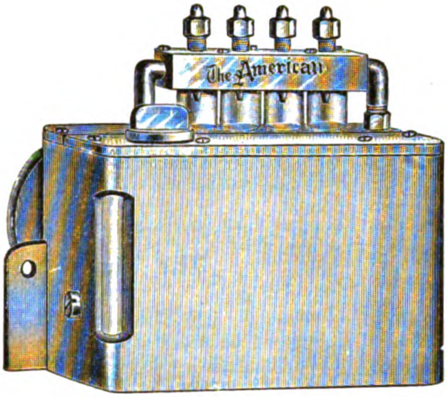


Sectional View of the Apple Automatic Stora
tery Charger.

together to form the armature core
core is fitted on the brass sleeve faste
a key to the shaft. The fields are
magnets excited by a current genera
the machine itself, and there is there
possibility of their losing their mag
The commutator is built up of segm
the best drawn copper, with amber n
insulation. The segments and insulat
forced together under pressure, and th
no threaded parts to the commutator
loose.

This charger is furnished with two
of bearings, the plain type with ren
phosphor bronze bushing, or with Hess-
ball bearings. Dayton Electrical Mf
Dayton, Ohio, are the manufacturers.

The American Positive Mechanical Lubricator.



This lubricator is developed as the result of long experience in the con- ruction of mechanical oiling devices, and the experimenting necessary to discover s advantages and disadvantages has been made by us. It is being marketed as perfected article, which is a guarantee that it will be safe for manufacturers to dopt it.

Successful and reliable lubrication is one of the vital problems which have onfronted automobile makers. We have kept this fact continually before us, nd as a result the **American Positive Mechanical Lubricator** is all hat can be desired, and fills a long-felt want. The operation is very simple. he oil is driven into a force pump cylinder, which compels it to wend its way hrough the proper channel until it reaches the bearings. During the passage, it oes through the sight-feed bridge, which indicates the various bearings by indi- idual sight-feed glasses.

The oiler can be attached to the dash-board, and in addition to its being nder the eye of the operator at all times, it is an ornament worthy of a prominent lace on any automobile. The work of the lubricator can be seen at any time ithout disturbing any connection or adjustment, and the opening in the reservoir r filling is sufficiently large to prevent wasting of oil.

The adjustments are made by knurl heads, or screw driver feed as desired.

The above cut is that of a four-feed lubricator, but we make these for any umber of feeds desired. The lubrication is constant with either rotary or ratchet rive. The body is made of aluminum, highly polished. The sight-feed bridge, nuckles, elbows, etc., are made of brass highly polished and plated.

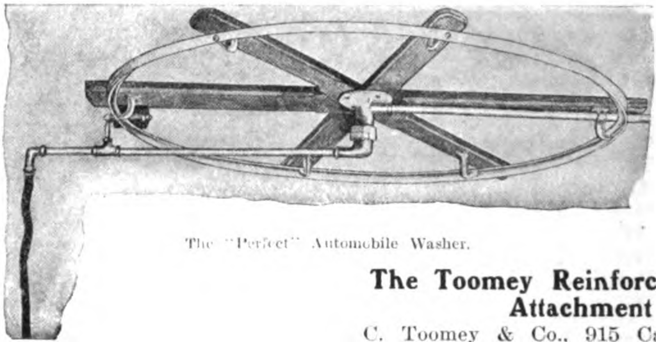
It is the greatest automobile lubricator ever offered for sale. The mechan- sm is fully illustrated and described on page 232.

Further particulars upon writing to

AMERICAN LUBRICATOR COMPANY
93-97 Catherine St., Detroit, Mich.

The "Perfect" Automobile Washers

The Perfect Manufacturing Company, Saratoga Springs, N. Y., make five styles of the "Perfect" automobile washers. The general construction of each is similar, consisting of an elliptical track, of finished brass, 7 feet in diameter, and ¼ x ¼ in. in rim. upon which runs a rubber covered, ball bearing roller, carrying a hose arm. The track is fastened to the ceiling of a garage or stable by means of six strong hangers of maple leaf design, suspended from as many specially made wooden cross beams. The track being elliptical gives the roller long life as the wear is on practically all parts. The revolving joint which connects the feed pipe and the arm located in the center of the machine is so constructed that it will not leak and being made of heavy cast brass is strong and durable. This joint is used on styles Nos. 3, 4 and 5.



The "Perfect" Automobile Washer.

Style 1 has pipes and fittings of wrought iron and four fine varnished cross beams. The roller is made of wood. The brass revolving joint has a large stuffing box. This machine is brass finished and sells for $20. Style 2 is similar to Style 1, excepting the pipe and fittings which are galvanized iron. The roller is rubber covered and ball bearing. It is filled and bronzed and sells for $25. Style 2a is same with the "Permaco" shut off revolving joint and sells for $40.

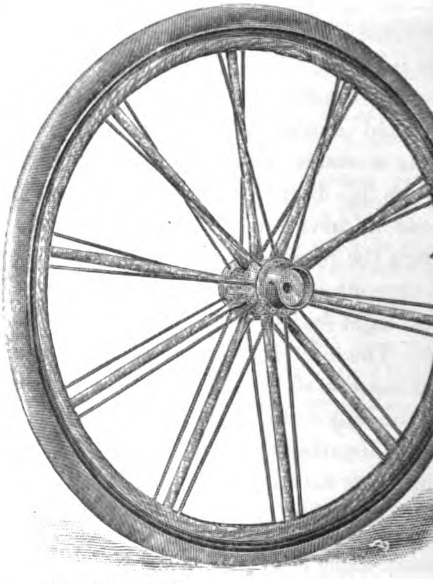
The "Permaco" revolving joint is constructed of heavy brass and has a short bar or lever with a pin in the middle connected to the shut off in the joints, which has both ends connected to a handle controlled by the operator. The flow of water is stopped or started by merely pulling this handle.

Style 3 differs from style 2, the six varnished arm crossheads being of cedar, the track being angle iron with an extra large body revolving joint with a six inch flange. The revolving section is 1½ inches in diameter and the stuffing box is extra large. This style is filled and aluminum bronzed and sells for $40. With the "Permaco" revolving joint (Style 3a) price is $10 extra.

Style 4 called the Double Perfect is the same in general construction as Style 3, but has a double revolving joint and two hose arms so that two men may operate conveniently at the same time. One of the hose arms is provided with a shut off handle. Price is $60. In Style 5 the crossheads are six-armed, beveled edged, with rounded ends and rubbed finish. The track pipe an tings and hangers are finished in nickel-p brass. The "Permaco" revolving used is finished brass, nickel-plated. outfit sells for $90, or $100 with the maco" joint. The "Perfect" carriage w is offered free for 20 days' trial.

The Toomey Reinforcing Spo Attachment

C. Toomey & Co., 915 Campbell s Kansas City, Mo., are making an aut bile wheel reinforcement, consisting o extra steel spokes and two hub bands, w they use on wheels of their own manufa and also sell separately. These attachm will fit any make of wheel. The hub b can be used on either wooden or metal

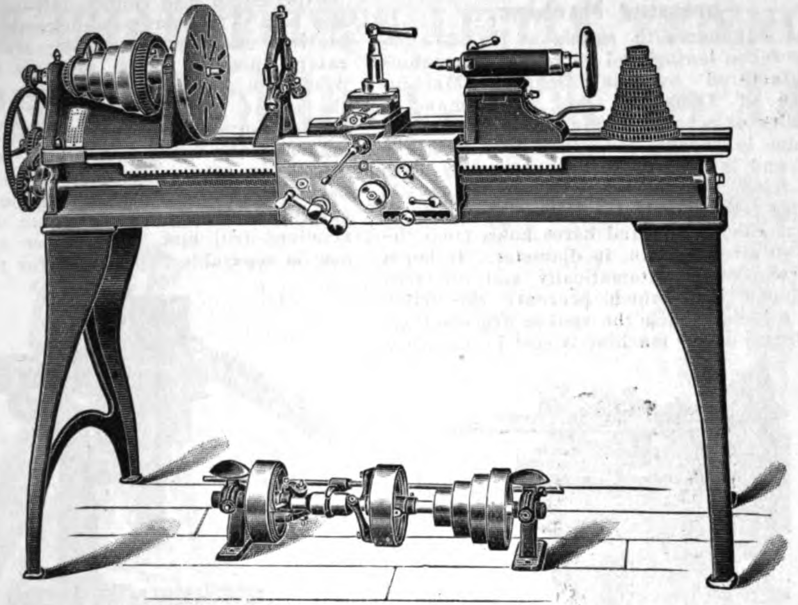


The Toomey Automobile Wheel Reinforcement

The steel reinforcing spokes are fastene both sides of the main spokes. The i ends of the spokes are fastened to the fl of the hub band and the outer ends are tened at the felloe, one preceding and following the regular wooden spokes.

The Toomey reinforcement keeps the w true and adds very considerably to strength.

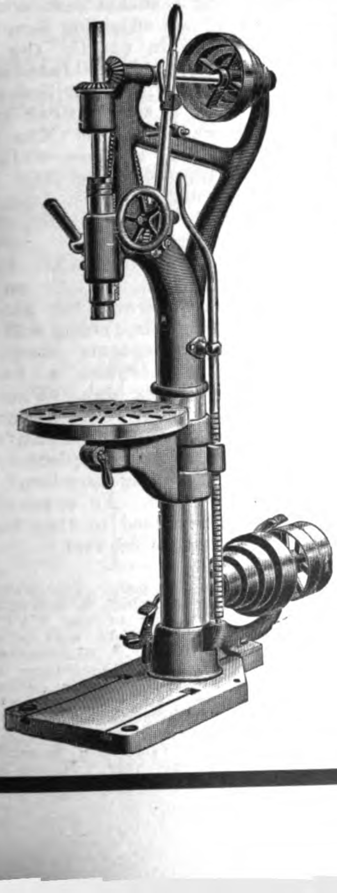
Briggs Carriage Company, Amesb Mass., are now manufacturing tops for trade generally. Formerly they manufa ed for one company only.



No. 13 Lathe 13" Swing Compound Rest, Automatic Cross Feed, and Counter 5 ft. Bed List, $157.00

Same Lathe, 6 ft. Bed List	**$167.00**
Same Lathe, 7 ft. Bed List	**177.00**
Same Lathe, 8 ft. Bed List	**187.00**
Same Lathe, 10 ft. Bed List	**207.00**

RAISING BLOCKS to swing 18 inches
$15.00 extra



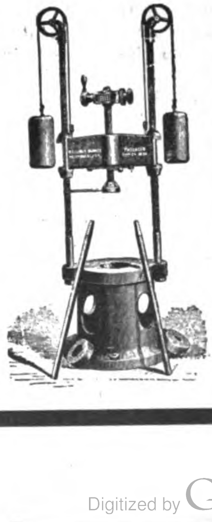
The

"Original Barnes"

W. F. & John Barnes Co.

204 RUBY STREET
ROCKFORD, ILL.

We also make Drills
8 to 50" Swing

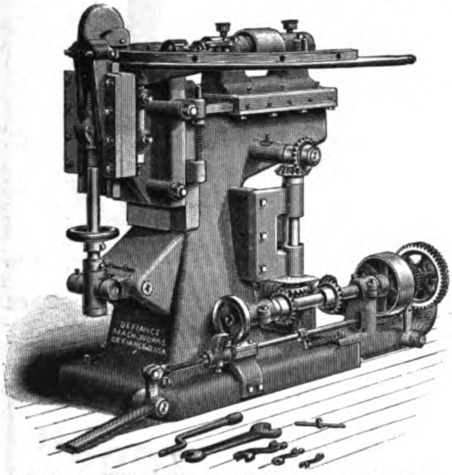


Arbor Presses for straightening shafts, etc.

No. 1 Arbor Press,	$ 65.00
No. 2 Arbor Press,	$100.00
No. 3 Arbor Press,	$125.00

Defiance Felloe Boring and Compressing Machine

The cut herewith shows a No. 3 automatic felloe boring and compressing machine manufactured by the Defiance Machine Works of Defiance, Ohio, who make a specialty of wheel making machinery. This machine is suitable for either light or heavy work and is used for boring the tenon holes in a felloe for the reception of spokes. It handles felloes from ½ in. to 8 in. wide in various thicknesses and bores holes from the smallest sizes to 3 in. in diameter. It bores and compresses automatically and produces an oblong hole which prevents the felloe from splitting when the spokes are inserted. The frame of the machine is cast in one piece with cored centre and is of sufficient strength to take the heaviest work with ease. The boring spindle is of steel, has heavy bearings, and is provided with a universal chuck to hold the augur.


DEFIANCE MACH. WORKS DEFIANCE, OHIO

Defiance Felloe Boring and Compressing Machine.

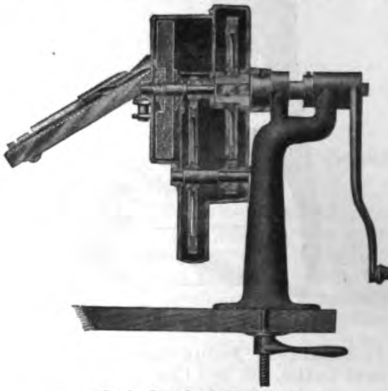
The thrust of the spindle is received by an automatic cushion when returning from the work which entirely overcomes noise and jar and adds much to the life of the machine. The automatic compress is very powerful and can be quickly adjusted for felloes of different width. A self-spacing adjustment on the table accurately spaces the distance between the spoke holes.

This machine is fitted with large wearing surfaces and cut gears are used throughout. The net weight of the machine is 1600 lbs. and it has a cubic measurement of 61 feet.

Cook Standard Tool Grinder

The cut herewith shows a tool grinder put out by Cook's Railway Appliance Co., of Kalamazoo, Mich. This grinder, while originally designed for railway use, would appear to be applicable to machine shop and factory use, simple means being provided for holding same to the bench. This grinder is of simple construction, and being made to withstand the hard usage to which railway track tools are subjected, is very durable. Its simplicity of construction also adds to its durabili inexperienced men cannot damage it by less use. The gears are enclosed in a m ble iron shell and the emery wheel is rately encased, which prevents any dust from getting into the gears and c the same.

The high speed journals run in brass ings and the internal bearings are oil means of tubes extending from the part of the casement or shell. The disc covers the emery wheel has an openin grinding drill bits. The upper part o disc is separable and hinged for the pu of throwing it back when grinding tools. For sharpening drill bits there holding device fitting a socket cast wit disc. By means of an adjusting scre drill bit can be held in exactly the position with reference to the face o emery wheel while grinding both lips o bit, thereby securing a symmetrical cu edge and the necessary clearance. The e wheel is geared at a ratio of 26 revolutio one of the crank, approximately 2000 M. It is 6 ins. in diameter by 1 in. face. grinder complete with column weighs 3



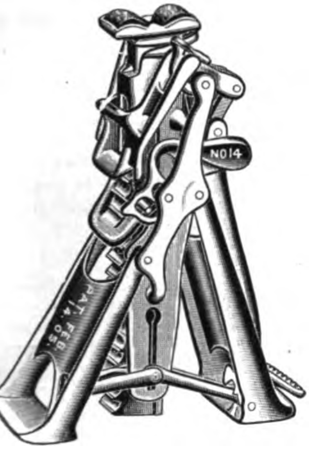
Cook Standard Tool Grinder.

The F. W. Spack Machine Co., In apolis, Ind., who are working night and in order to fill their contracts for air pressors, automobile parts, etc., will consolidate their three separate shops one. This change will require a bui 64x175 feet and two stories high. This pany is making a specialty of autom gear and sprocket work and the manufa of special parts, such as pistons, piston connecting rods, etc., having excellent ities for making the same. An erecting partment will later be added to the fac making the total frontage 86 feet.

This issue is sold for 50c. a copy. The next will be a triple show number, which is worth a as much. The March number of the CYCL AUTOMOBILE TRADE JOURNAL will be a plete vehicle number, in which an illustration description of every car on the American m will be printed, arranged compactly for compa and reference. There are many other special bers throughout the year, in addition to the amount of matter contained in our regular bers. You will do well to subscribe immedi Subscription price is $1.00 per year. Blank w found on page 444.

THE CHAUFFEUR'S LITTLE FRIEND

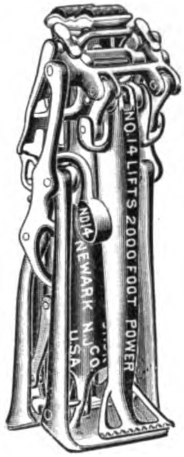
Searls' Folding Jack No. 14



Set up, scale ¼ size
Broad Base

Weight 5½ lbs. for cars up to 3500 lbs. Lifts 2500 lbs. with great ease and on a square test will lift the entire car for which it is intended.

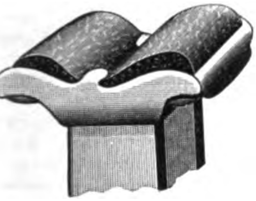
The main lever, 7 inches long has a ⅝ fulcrum acting on an intermediate lever that multiplies the applied power $2\frac{8}{10}$ times. Hence the immense result in ease of operation from FOOT POWER OPERATION from a short compact construction, standing only ¼ inches high, to go under low axles, trusses, bars and the adder extending to lift 38 inch wheels.



Folded
Smallest Base

Like all our jacks, light weight, to meet light weight in car onstruction, guaranteed strength, compact form for transportaion and any condition of service.

WITH FOOT POWER they lift any car quicker and easier than any device ever made.



Our Leather Axle Rests will not mar any part of the car where it may be used. Used on Nos. 14 and 16 and on others when ordered.

RATING AND LIST PRICE OF OUR JACKS.

No.	Weight	Car Weight	Folding	List Prices
6	3¾	1500	"	$2.50
8	5	2500	"	3.50
10	4½	2000	"	3.20
12	5½	2800	"	4.00
14	5½	3500	"	5.00
16	6½	5000	"	5.00
9	4¾	2500	Single Leg	3.00
11	4¾	2000	" "	2.50

os. 8 and 9 lifts the highest horse drawn Carriage Wheels.
Ask your dealer or we deliver in the U. S. and Canada.
WE GUARANTEE ALL WE SAY.

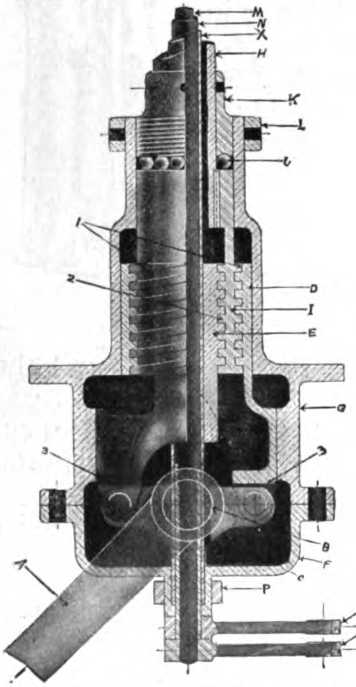
JERSEY BRAKE CO.

56 Columbia St., Newark, N. J.

Gemmer Steering Device

The Gemmer Engine Co., of Marion, Ind., have placed on the market a new steering gear on which all wear on all bearings is taken up with one adjustment and in which the design is such that no shoulders can form on any bearing. This gear is built in two sizes and can be furnished complete with wheel, post, quadrant and controlling rods ready to place in the car if desired. The operation of the device can be understood by reference to the accompanying cut explained by the following descriptive matter.

When the steering wheel is rotated in one direction it rotates a steel nut (I) through the steel column (H) by the action of a right and left hand thread. One of the nuts is forced down against some one of the pivot blocks (3), depressing that end of the rocker arm and at the same time the other nut is raised.

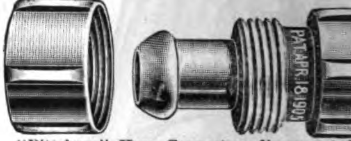


Gemmer Steering Gear. (A) Lever arm, broken off end of which is provided with the usual universal joint. Shaft (B) is part of drop forging (C) rocked by means of nuts (D) and (E). Shaft (B) has its bearing in lower case (F), upper half being formed by case (G). (H) Steering column rigidly secured to the steel nut (I). At (1) this steering nut has right hand threads outside engaging with nut (D) and left hand threads inside, as shown at (2) engaging with nut (E).

It will be noted that D and E are free relative to their vertical movement in the case G; also, it will be noted that all bearings are such that all wear is taken up by the adjusting nut K. All wear on the threads is on one side. When the adjustment is made this nut is held in position by the lock nut L. It will be noted also that the construction throughout is such that any movement from the neupral point causes the wearing surfaces to overrun, thus preventing any shoulders from wearing, causing a tendency to stick or bind. M and N are the controlling rods which operate the carburetor and timer t the levers O and R. X is the sta tube fastened at P, which carries the rant above the steering wheel. In q orders the outside of the cases F may be changed to provide suitable m attaching to any car. Also, such de the levers O and R and the quadrant the steering wheel may be changed the requirements of each individual ca lever A may also be made of the right to give the proper throw.

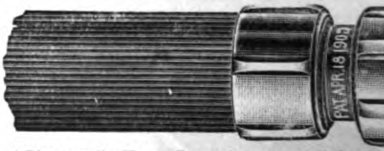
The "Pittsburg" Hose Conne

Pittsburg Hose Connector Co., 2623 street, S. S., Pittsburg, Pa., have market a hose connector, the strongest of merit for which are that it is easil ated and that the joint is a good tig If an automobile is equipped with th nector, the hose can be moved instan



"Pittsburg" Hose Connector, disconnected

attached again just as quickly and place by simply screwing up the slee the hand. The sleeve tightening th against the body of the connector doe with the need of a washer. These ar adopted by a number of the largest facturers of automobiles, and no dou be welcomed by the users on account



"Pittsburg" Hose Connector, connected to

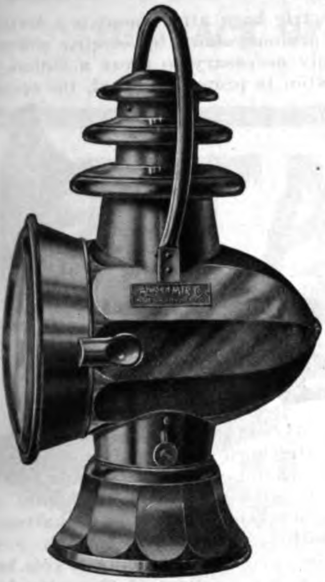
relief afforded from the annoyance ca defective and leaky joints. With th nector the use of wires and clamps is obviated and no tools are required t the connection after the connector applied. There are no projecting pa altogether it presents a neat appearanc made for any sized hose and for all p

---

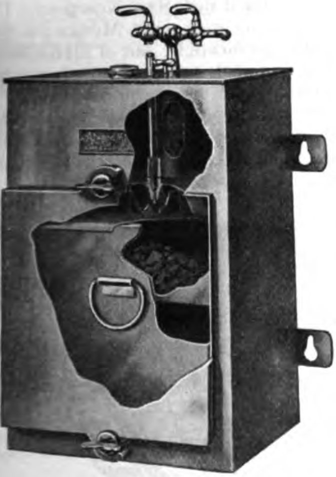
In the advertisement of F. A. Go Marietta, Ohio, in our December issu 364, a cut of model A "Snapit" swit used instead of one of Model B. M described page 168, November Journal only model he now makes, Model A been discontinued.

Boston Woven Hose & Rubber Co. bridge, Mass., are making a specialty manufacture of insulating tape in add their other lines of goods. Their t understanding of the essential qualiti high grade tape enables them to co improve their goods and produce exc values. Their tapes have great re to heat and high insulating power, t tion being carefully compounded of material and thoroughly worked into t

Lamps and Generators



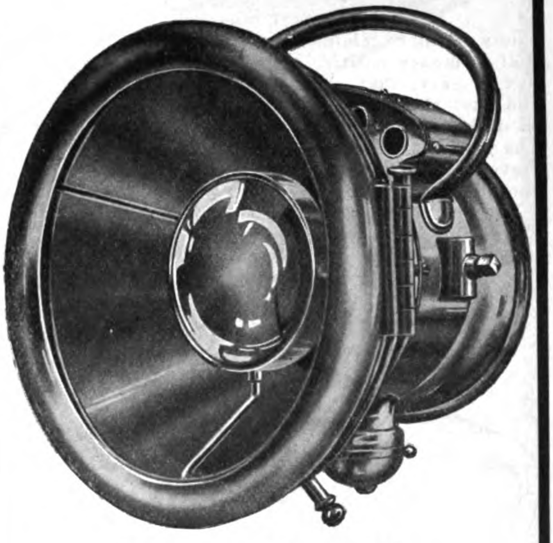
Model No. 31. Very Latest
Design. Pat. applied for.



Atwood Generators surpass nything ever heretofore placed pon the market. Simple and ffectual. Every obstacle has een overcome. They have **no qual at any price.** Money ack if not perfectly satisfactory. Pat. applied for. The famous Atwood Generator.

Atwood
Manufacturing
Company

Amesbury, Massachusetts

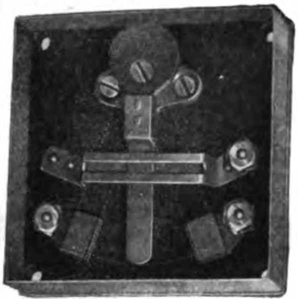


Parabola Headlight

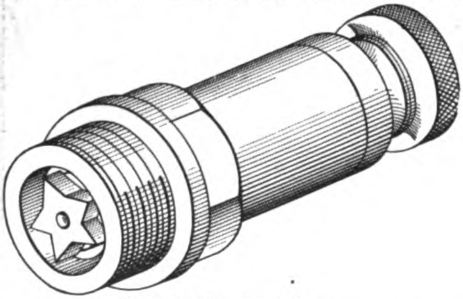
ATWOOD LAMPS are the highest grade Lamps made. Styles are the latest and richest. Get our catalogue showing full line Gas Head Lights, Generators, Oil Side Lights and Tail Lamps. See our exhibit space No. 91 Madison Square Garden. New York Show.

B. & J. 1906 Accessories.

Besides an improved form of the B. & J. electric switch which has heretofore been described in our news columns, the B. & J. Mfg. Co., now at 1218-1220 Michigan Ave., Chicago, will put out for 1906 two other specialties, the "Star" spark plug and an electric horn attachment. From the interior view of the 1906 B. & J. switch shown herewith, it will be seen that it differs slightly in construction from that which we previously described. The 1906 construction is so plainly shown by this cut that detailed description is not necessary. The particular points of merit claimed for this switch are, that it makes positive contact and that contact is easy, that short circuit is impossible and that the switch is light in weight, neat in design and easily kept bright and clean. The switch is provided with a Yale lock and prevents the car's use when the owner is absent. Price is $5.00.


B. & J. 1906 Electric Switch.

The Star spark plug is so named on account of the shape of the end of the centre electrode. It will be noticed that the end is in the form of a five-pointed star giving five chances for a spark. A peculiar feature of this plug is the fact that the insulation is of steatite and not of porcelain or mica as is usually the case. This insulation is claimed to be non-absorbent and smoot proof, and further, that it cannot crack or break under the most extreme temperature. Surrounding the centre rod is a steatite core and surrounding this a steatite casing. At the outer end of this casing is a cap which is held down by a thumb nut on the extreme outer end of the rod. The engine end of the plug consists of the usual metallic shell, which does not, however, extend the full length of the plug. The steatite casing is exposed between the shell and the outer cap.


B. & J. Star Spark Plug.

The plug can be taken apart, clean
reassembled in a very short time an
very durable. All parts are interchan
The plug complete lists at $1.00 and se
parts can be obtained at from 10 cent
cents each.

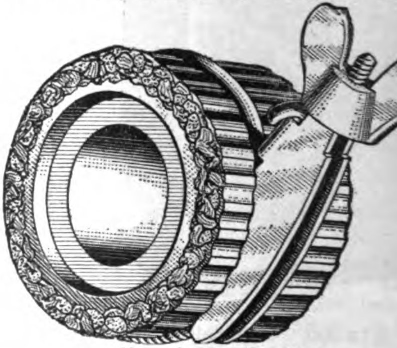
The electric horn attachment is a de
blow an ordinary horn by electric po
It is only necessary to press a butto
if the button is properly placed, the o
can blow the horn at any time with
moving his hand from the steering
The device gives a continuous signa
the finger is taken from the press butt
desired buttons may be placed on s
parts of the car. The attachment can
plied to any horn. Price of this attac
is $5.00.

B. & J. Electric Horn Attachment.

Morgan's Hose Coupling.

B. Morgan, 86 John St., Newport,
well known as the maker of Morgan's
Piece Valve, has brought out a little n
in the shape of a hose coupling for g
use, but particularly for automobiles.

As will be seen by the cut the device
ceedingly simple and can be used indefi
They are supplied long enough to cl
1½ in. pipe, and if used for smaller pip
simply cut off the surplus screw wire
¼ inch beyond the nut.


Morgan's Hose Coupling.

No tools of any kind are necessary
few should be carried in all tool bag
boxes.

The subscription price of the CYCLE & AUTOM
TRADE JOURNAL is $1.00 per year. This include
special numbers which are worth 50c. each, in addi
the regular numbers. You will therefore receive $
value for $1.00. Subscription blank will be fo
page 444.

LET US GIVE YOU A LIFT

THE JACK OF JACKS

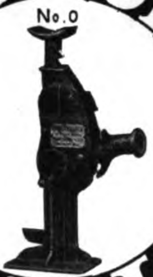
Light—Durable—Reliable

PATENT APL'D FOR.

STANDARD AUTOMOBILE JACK

WEIGHT 8 1/2 POUNDS

LIFTING 1 TON CAPACITY



All the BEST features of other Jacks, with special features of its own, are embodied in the STANDARD JACK. It will lift your car, raise your spirits, and stand by you, through thick and thin. Easily operated and accidental dropping of load impossible. We stand back of every one of these Jacks with our guarantee covering any and all defects, either in material, workmanship or efficiency. Don't take chances with a poor Jack. It don't pay. The STANDARD JACK is so simple—a turn of eccentric side of frame reverses the movement of the lifting rack upward or downward as desired. For sale by dealers everywhere or write us direct.

See our exhibit, Automobile Club of America Show, 69th Regiment Armory, New York, Jan. 13th to 20th, 1906, and N. A. A. M. Show, Colliseum, Chicago, Feb. 3rd to 10th, 1906.

Made by COOK'S RAILWAY APPLIANCE CO.

Successors to

MERRILL-STEVENS MFG. CO.

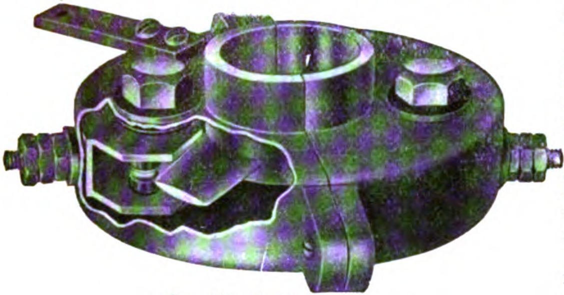
(No change in ownership or management.)

KALAMAZOO, MICHIGAN, U. S. A.

"Powell" Muffler and New Double Contact Timer

Powell Mfg. Co., Clinton, N. Y., have brought out a new double contact timer, shown herewith.

The Powell double contact timer is made from one hollow brass casting split through the centre on a line with the shaft on which it turns. All moving parts and contact are made from tool steel inclosed within the outer casing and running in grease. No fibre is used other than the washers under the binding posts and contact sockets, these being so thin that there is no chance for expansion or contraction. By unscrewing two lock nut screws the outer casing may be removed without detaching the battery wires, thus showing the centre contact, which is pinned and keyed to the shaft.



"Powell" Double Contact Timer

The centre contact is a knife projecting out and a part of the collar that is keyed to the shaft. The cut illustrates the timer as adapted to a two-cycle engine with part of the outer casing cut away, showing the centre contact about to pass between the two outer ones. The outer contacts which the centre one pass between are tempered steel plungers sliding in steel sockets with springs to press them out. The contact sockets are located opposite each other, one on each side of the timer casing, screwing into a centre bridged nut, with fibre washers to insulate them from the wall of the outer casing. The binding post is connected to the top of the bridged nut, forming electrical connection, as well as preventing the nut from turning.

"Powell 20th Century" Muffler.

By rotating the engine shaft the centre contact of the timer will pass between the outer ones at the proper time, one passing on each side of it, forming a double contact which insures very economical results. In case one of the contact springs breaks it will not interfere with the operation of the other.

The secondary shaft passes through the entire length of the timer, providing
bearing surface which is self grease
ground contact bearing on the collar
centre contact is connected with a t
on the exterior of the timer. The oute
ing of the timer is protected with a c
screws over the end, making it dust t

Their 20th century muffler is made o
cession of pressed steel cups, so design
the top of one fits tightly and firmly i
base of the next one.

The muffler is assembled with tw
running through the head and cups,
tire arrangement being drawn up by t
on the outer end, making it very ri
fact, practically indestructible.

Each section is so perforated that t
gases are diffused onto the cool walls
muffler, condensing and radiating the
and what is left passes out into the
a noiseless and comparatively cool co

We illustrate a 20th century muf
nine sections five inches in diameter
ated for a four and one-half in. stro
bore of engine of a four-cycle type. Al
mufflers are perforated according to th
and stroke of the engine and not ac
to the exhaust pipe size.

The Pontiac Body Co., Pontiac, Mic
been reorganized with R. F. Monroe a
cipal owner and D. E. Strohm factory
intendent. Mr. Monroe, who held th
trolling interest in the company an
the position of general manager, ha
chased the interests of Chauncy Brace,
Mesinger, J. A. Jacokes, J. A. Gral
Albro Green.

Wm. F. Nye, New Bedford, Mass.,
factures an odorless and colorless rus
ventive for all kinds of metal, and its
liness, purity and healing qualities re
a perfect emollient. It will clean and
bright metal work, revive dull enamel,
furniture, and is also claimed to be an
lent lubricant.

Chas. P. McClellan, Fall River, Ma
offering for 1906, cape tops for side en
tonneaux and run-abouts of all st
makes and will carry these in stock to
prompt delivery. These tops are ma
second growth white ash bows with p
nickeled bronze bow sockets and rests.
are made of khaki duck, have fiberoid
in curtains, front straps and solid brass
les, loops and snaps. The body iron
goose neck style and the latest fastene
used. These cape tops are made from
are guaranteed to fit and look well.

No 0
1 TON
No 0
1 TON

The
HIGHEST GRADE
AUTOMOBILE
JACK
ON THE MARKET IS THE

BUCKEYE JACK

Do Not Contract for Your 1906 Requirements Until You Have Investigated the

BUCKEYE

In addition to the best Jack we have the price which saves you money. They do three things without fail:

1st. They satisfy Automobile MANUFACTURERS.
2d. They satisfy Automobile DEALERS.
3d. They satisfy Automobile OWNERS.

This is guaranteed, and is all any jack can do. If you want the best

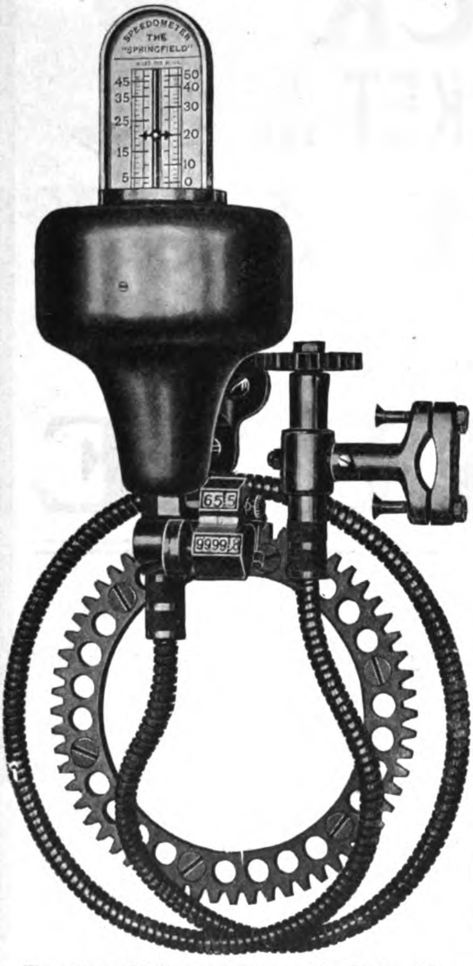
JACK
CORRESPOND WITH
THE
Buckeye Jack Mfg. Co.
LOUISVILLE, OHIO.

No 0
1 TON
No 0
1 TON

The "Springfield" Speedometer.

A new speedometer called the "Springfield" has recently been placed on the market by The R. H. Smith Mfg. Co., of Springfield, Mass., a concern which has been established in similar lines since 1865.

In this instrument, by a novel application of the most approved form of centrifugal governor, the pointer rises by direct and positive action upon the face of a vertical indicating scale or dial, as shown in the illustration. It is sensitive to the slightest variation of speed, but cannot be diverted from its true position by any jolt or shock which the car may sustain. Its accurate indication of speed is guaranteed at all points on the scale.



The "Springfield" Speedometer with Veeder Odometer and attaching fixtures.

Every motion is balanced and consequently nearly frictionless. All internal parts are of steel, and hardened where advantageous. All bearings are self-lubricating. The case is dust and waterproof. The dial is self-luminous and will show position of the pointer after dark. The case and trimmings are of phosphor bronze, which matches the yellow brass fittings of most new cars.

The instrument attaches to the das
by a jointed bracket, permitting it to
any desired angle. Each is supplied
flexible shaft with improved double
jacket of correct length for the car on
it is to be used, but the bracket by wh
pinion is attached to the steering knu
universal and will adjust in any direct
as to fit any American-built car.

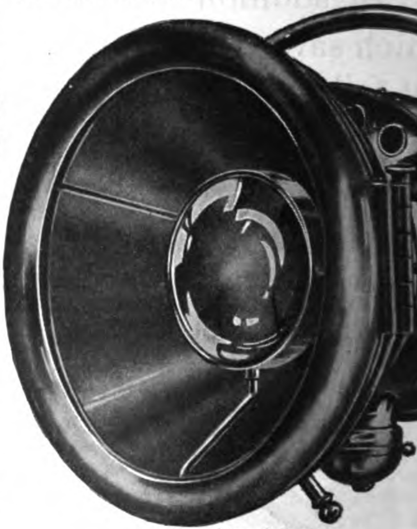
This bracket also has a valuable ex
feature by which if the pinion sho
thrown out of mesh with the gear on t
by the lodging of any hard substance,
not only cause no strain, but will a
ically return to the correct pitch line
as the gear has cleared itself.

Two standard instruments are being
one for general use, registering from
miles, the other for high power cars,
tering from 1 to 80 miles. Both si
offered with and without the odometer,
is the well-known Veeder trip and
register instrument. This is inge
mounted upon an independent shaft, w
coupled between the flexible shaft a
speedometer. It may be removed a
shaft coupled direct without it, the cl
the shaft fitting the clutch on the spi
either.

The price of the 50 mile speedomet
fittings is $25.00 without odometer, or
with; price of 80 mile instrument, $35.
$45.00.

The Atwood Headlight.

Atwood Mfg. Co., Amesbury, Mass
brought out a new headlight of popul
designed to meet the large and insist



New Atwood Lamp.

mand for a lamp on these lines. Th
illustrated has a parabolens reflecto
they also make the same style with a
mirror reflector. Various sizes are offe

The triple show number to be issue
ruary 1st will be another record b
Don't miss it—send in your subsc
promptly on blank you will find on pa

The 1906
BARRETT Automobile JACKS
Barrett's Patents

represent the **highest attainment** in the line of lifting devices yet produced any where in the world. The new designs of **Barrett Jacks** are **single-acting,** they raise the car on the **downward** movement of the lever **only,** the **upward** stroke being **perfectly free. These are the only Jacks on the market that may be operated conveniently on any automobile without interference from the body of the car.**

1 Ton
DUFF MFG. CO.
ALLEGHENY, PA.

GOLD MEDALS

(HIGHEST AWARDS)

WORLD'S FAIR ST. LOUIS
AND
PORTLAND (Ore.) EXPOSITION

1 Ton
No.00.
THE DUFF MFG. CO.
ALLEGHENY, PA.
BARRETT'S PATENTS.

The **Barrett Jacks** have been exclusively adopted by every leading manufacturer and practically all operators and dealers. They are preferred and specified in nearly all cases and are recognized as the **only reliable, substantial** and **economical** Jacks on the market, covering every condition and adapted to any automobile.

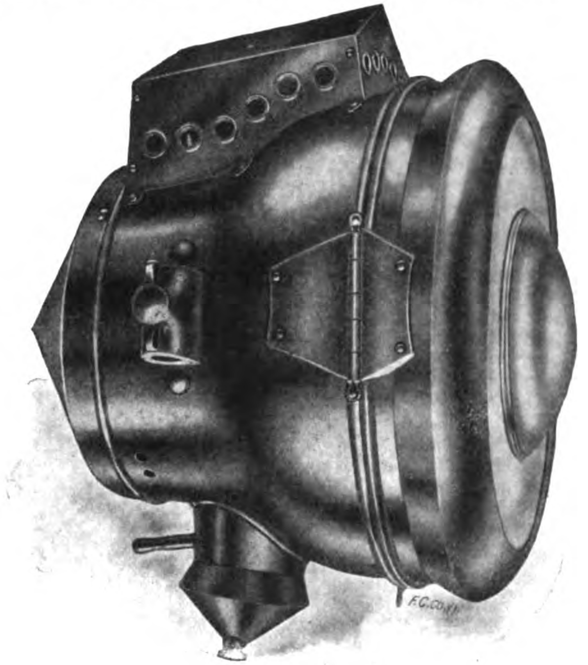
Beware of cheap imitations of a few of our old sizes. We desire to caution purchasers against being deceived. The Barrett Jacks are made exclusively by this Company—other Jacks represented to be "the same" are cheap imitations.

Send for Catalog "O-C" 1906

THE DUFF MANUFACTURING COMPANY
Established 1883
Works—Allegheny, Pa. PITTSBURG, PA.

A. S. M. Co.'s Horns and Lamps

Automobile Supply Mfg. Co., 320 Driggs avenue, Brooklyn, N. Y., are among the most successful manufacturers of horns in this country and they do a very large part of the aggregate business in domestic horns. They produce every style and size required by the trade and can meet any demand. The lamps are made by experienced French artists, who are thoroughly versed in the business.



The "Jap" Lamp.

One of their latest lamps is the "Jap," shown herewith, which is an entirely new design and is meeting with great favor with jobbers and car manufacturers. It is equipped with an imported genuine optical front glass with bull's eye, and will throw the light an incredibly long distance.

The Mercury Arc Rectifier for Private Garages

General Electric Co., Schenectady, N. Y., is meeting with a big demand for its Mercury Arc Rectifiers for private garages, this device, which changes an alternating to a direct current, enabling the electric car owner to charge his own vehicle from the ordinary lighting current.

The Mercury Arc Rectifier Set consists of the following principal parts: Panel, tube, holder and compensating reactance.

The panel is made of the best slate, 48x24x1½ in., with ⅜ in. bevel; is given a dull black finish, mounted on 1 in. supporting pipes and supplied with all necessary pipe braces, clamps and flanges. It contains voltmeter, ammeter, double-pole switches for connecting to carriage and alternating current mains,
and the necessary double-pole and sing
switches for starting and operating the
fier. Fuses and circuit breaker are su
for protecting the rectifier against
overloads.

The tube is an exhausted glass vesse
taining two anodes, one cathode an
starting anode. It is provided with
caps for the terminals, which prote
electrodes. The leads from the anod
connected to the compensating reactan
lead from the cathode forms the positi
of the direct current circuit.

The holder consists of a moving n
mounted on the face of the panel ar
vided with spring clips for holding th
Terminals for connecting the various
of the tube to the panel are mounted
panel.

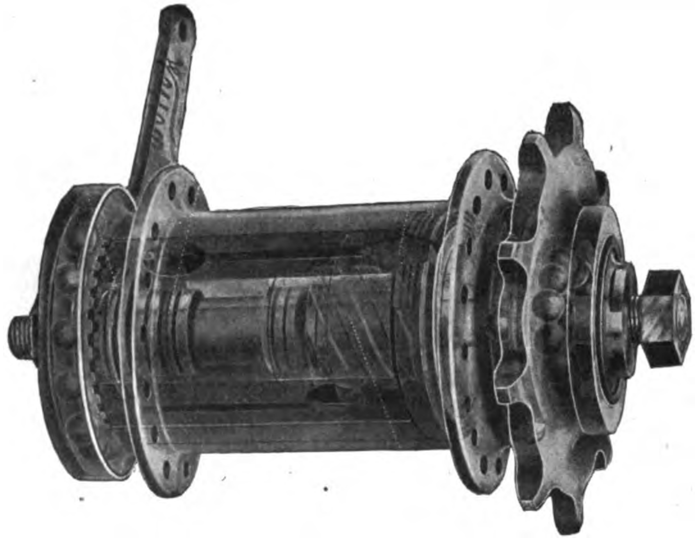
The compensating reactance is con
directly across the alternating current
mains and is either mounted on the
of the panel or placed on the floor
the panel. Leads are brought out fr
reactance to a dial switch mounted
front of the panel. By means of this
the voltage and current may be varied
the limits of the rectifier. A tap is b
out from the center of the reactan
forms negative side of the direct
circuit.

The rectifier is now furnished i
standard sizes—10, 20, 30 and 40 ampe
complete outfit occupies a floor space
proximately 24x18 in., and is 76 in. h
can be adapted to any direct current
necessary for charging vehicle batteri
can be furnished for any commerci
quency.

REMEMBER
REPUTATION
REPRESENTS
RELIABILITY

It pays dealers to push that which practically does not require pushing. For this reason, it pays bicycle dealers to handle exclusively the

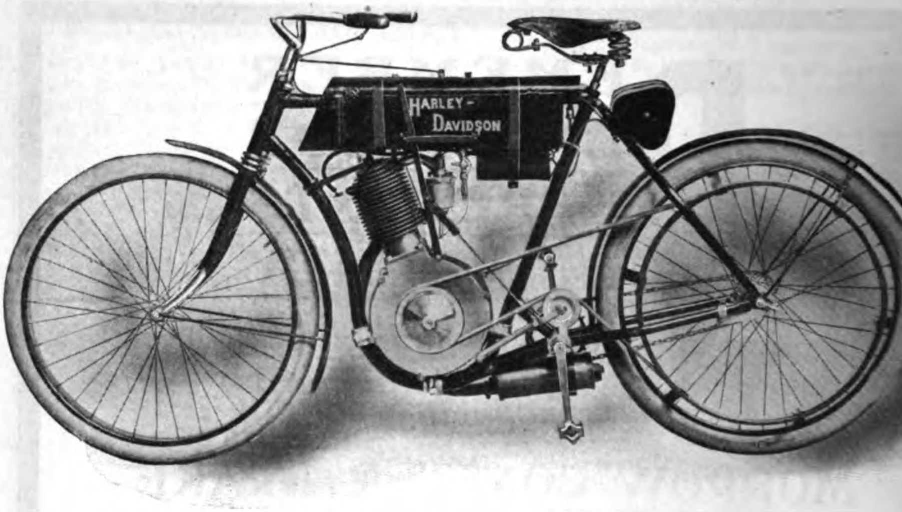
MORROW COASTER BRAKE



You might ask what the **MORROW** has in store for you. The correct answer would be,—"Profit and satisfaction." When it is sold, it stays sold. It does not come back to you because something has gone wrong. It is almost fool-proof, and so well-made that replacement of parts through wear and tear is not necessary.

We back this statement up with the fact that we have not been called upon to furnish one dollar's worth of repairs during the year.

ECLIPSE MACHINE CO., ELMIRA, N.Y.



The 1906 Harley-Davidson Motor Cycle.

The 1906 Harley-Davidson Motor Cycle.

The 1906 Harley-Davidson Motor Cycle, manufactured by the Harley-Davidson Motor Co., 315 Thirty-seventh street, Milwaukee, Wis., is the same in general construction as the 1905 model, but contains several important improvements in details, including a longer wheel base, lower frame, 2¼ inch G. & J. detachable motor cycle tires, three-inch mud guards, double spring seat post that absorbs all jarring, easy riding motor saddle and an extra large muffler with cut out. The machine is wired throughout with Packard cables. The wheel base is 51 in. long, height of frame 20½ in., being one inch lower than last year's model. Another improvement in frame construction is the use of a one piece head very strongly constructed and with extra long frame connections, extension front fork sides and double stem handle bars are used.

The grip control on throttle of the improved automatic float feed carburetor which gave perfect satisfaction on the 1905 model, will be the same on the 1906 machine. The excellence of this grip control lies in its simplicity, as it has no wires to stretch or universal joints to wear and break and has a friction adjustment on handle bar which keeps throttle at any position desired without being held.

A 1¼ in. waterproof, double ply, endless, flat belt is still used to drive the machine, with an idler, which can be adjusted by rider while machine is running. Price of complete machine with full equipment is $200.

Peerless Automobile Heater.

Willis F. Seaman Heater Co., Mineola, Long Island, N. Y., is United States sales
agent for a new heater for enclosed g
and steam cars. In this device the engi
haust is utilized, but no oder is allow
escape into the car. It lists at $15, a
quires practically no attention after bei
stalled.

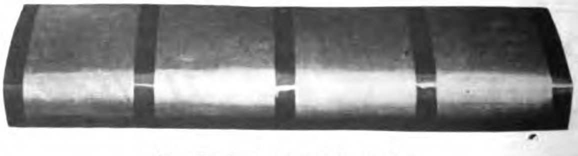
The Index Funnel.

W. T. Taliaferro Mfg. Co., 258 Broa
New York, have placed on the market

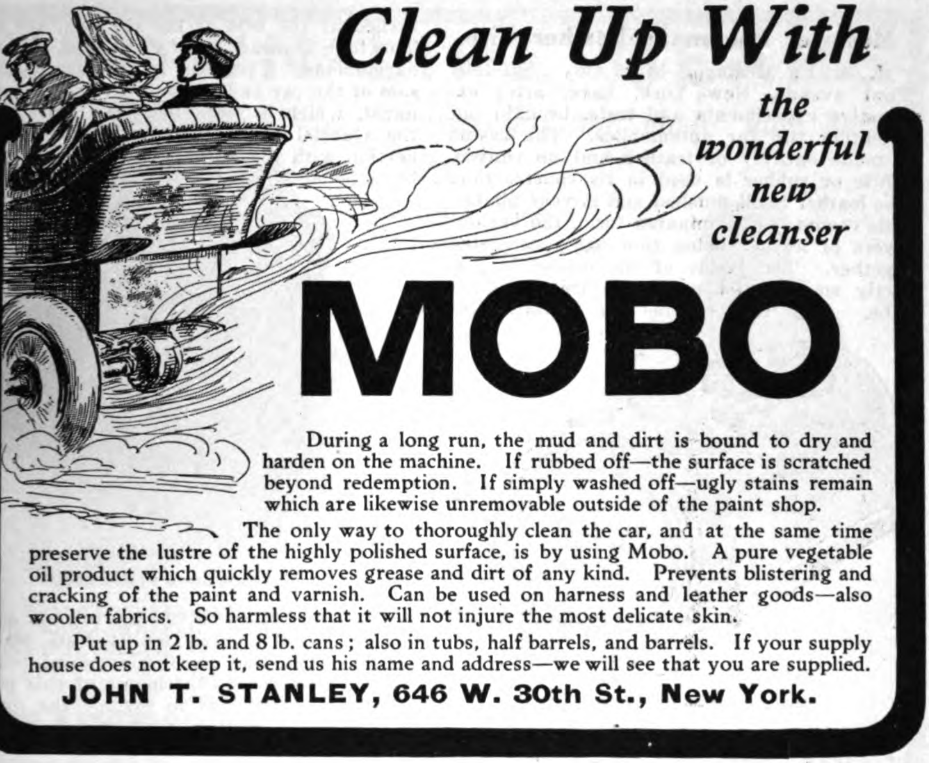
The Index Funnel.

funnel called the "Index," because of its
feature—an index which tells when the
is full. Another important feature
shape, which makes it convenient to u
usually inconvenient corners.

The Jones Speedometer Co., 124 W
street, New York City, in addition to
automobile speedometer, have brough
speedometers for both bicycles and
cycles which register speeds up to thirt
fifty miles per hour, respectively.



The Peerless Automobile Heater.



Clean Up With

the wonderful new cleanser

MOBO

During a long run, the mud and dirt is bound to dry and harden on the machine. If rubbed off—the surface is scratched beyond redemption. If simply washed off—ugly stains remain which are likewise unremovable outside of the paint shop.

The only way to thoroughly clean the car, and at the same time preserve the lustre of the highly polished surface, is by using Mobo. A pure vegetable oil product which quickly removes grease and dirt of any kind. Prevents blistering and cracking of the paint and varnish. Can be used on harness and leather goods—also woolen fabrics. So harmless that it will not injure the most delicate skin.

Put up in 2 lb. and 8 lb. cans; also in tubs, half barrels, and barrels. If your supply house does not keep it, send us his name and address—we will see that you are supplied.

JOHN T. STANLEY, 646 W. 30th St., New York.

"Favorite" Bicycles

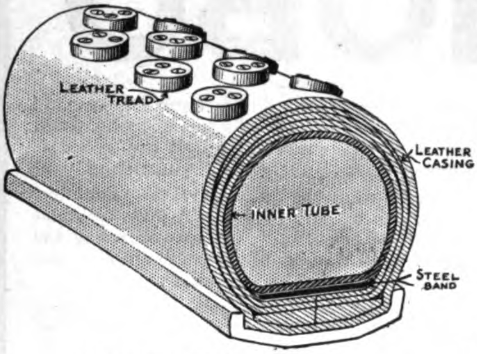
Adult and Juvenile For 1906

Our proposition will convince you where to place your business
The Fittest has Survived

THE TOLEDO METAL WHEEL CO., TOLEDO, OHIO

Mesinger Pneumatic Leather Tire

H. & F. Mesinger Mfg. Co., 1801-1807 First avenue, New York, have, after exhaustive experiments and tests, brought out a leather tire for automobiles. The casing is made entirely of leather and no canvas, fabric or rubber is used in its construction. The leather is oil finished and is very pliable. This casing is of laminated form, the various layers of leather being thoroughly cemented together. The inside of the casing is perfectly smooth and cannot injure the inner tube. The tread of this tire is formed of small discs fastened to the leather casing by screws. When these discs become worn off, new ones can be put in their place. The tire is fastened to the wheel by a steel band inside the casing, the ends of the band being tightened together against the rim by a nut.



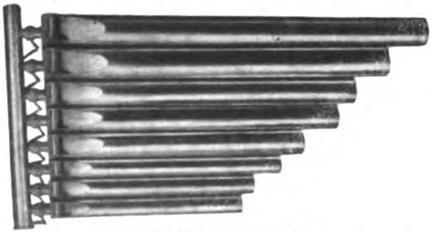
Mesinger Pneumatic Leather Tire.

In a test of this tire, the company run it over 1000 miles, after which it only showed but slight wear on the centre of the tread. During the test one of the tires was run 15 miles deflated without injury to the casing.

The Mesinger Co. will exhibit their tire at the New York show at Madison Square Garden, where they have space No. 205 on the second balcony.

Gabriel 8-Chime Horn

Gabiel Horn Mfg. Co., of Cleveland, Ohio, have brought out an 8-chime style of the Gabriel horn. They have been making heretofore, 2, 3 and 4-chime horns, but this addition to their line is a strictly musical instrument, the eight tones produced enabling the operator to play any ordinary tune, which is accomplished by means of a keyboard attached at the side of the car near



The Gabriel 8-chime horn.

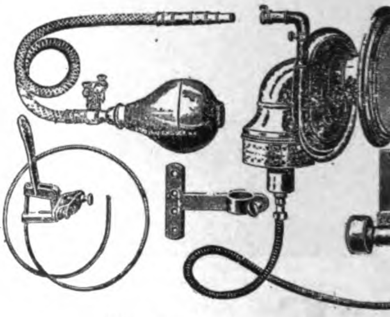
The tone is beautifully modulated
harmonious. The horn is attached
side of the car and is blown by the e
haust, which is regulated by a valv
the Gabriel Company manufacture
nection with the horn. This valve is
by a pedal.

Keyboard of Gabriel 8-Tone Chime.

Gabriel Horn Mfg. Co. are owners
ent No. 802,386, dated Oct. 24, 1905,
of this kind, and have commenced
ings against alleged infringers of this
They are ready also to assume the
of defending suits should any be
against their customers.

Miller Combination Siren

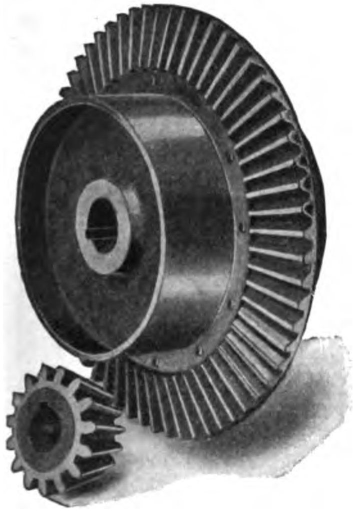
Chas. E. Miller, 97-101 Reade S
York, is marketing a siren horn whic
from the average because of the fac
is a combination of the ordinary horn
power operated siren horn; that is t
is fitted with a horn similar to La
horn, with screen and flexible tub
operated through a medium of a rub



Miller Combination Siren Horn.

and also by a mechanical device ope
a friction pulley brought into conta
the flywheel of the motor by means o
or pedal. This combination produces
of moderate tone for use in crowd
oughfares, where the car moves
speed, and a louder blast for the op
try. Price is $50.00.

BROWN-LIPE GEARS



Differentials for chain and shaft drive

Back lock steering

Sliding gear transmissions

Catalogue

and

Blue

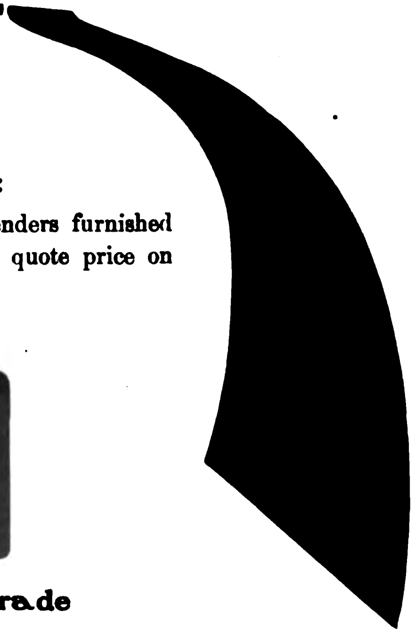
Prints

K. FRANKLIN PETERSON, 66 Lake St., Chicago
THOMAS J. WETZEL, 1 Warren St., New York } **Direct Factory Salesmen**

CHAS. E. MILLER, 97 Reade St., New York,
318-320 N. Broad St., Philadelphia,
202-4 Columbus Ave., Boston,
406 Erie St., Cleveland, Ohio } **Sales Agent, Carrying Stock.**

POST & LESTER CO., Hartford, Conn., Eastern Sales Agents

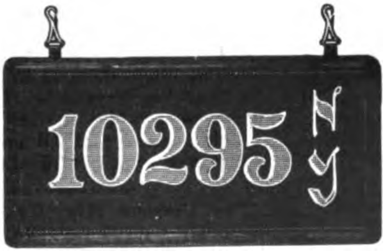
BROWN-LIPE GEAR COMPANY, 206 S. Geddes St., Syracuse, N. Y.



BUYERS OF AUTOMOBILES

Write to us as follows:

"We are disgusted with the cheap tin fenders furnished on the new machine we just purchased. Please quote price on your leather fenders."



Number Placards for the Trade

McKinnon Dash Company

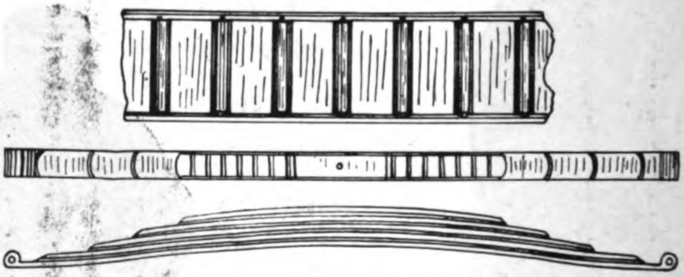
TROY, OHIO
CINCINNATI, OHIO

BUFFALO, N. Y.

ST. CATHARINES, ONTARIO

The Mercer Roller Bearing Spring.

Fred. J. Mercer Spring Co., Hyde Park, Mass., has placed on the market a novelty in the shape of a roller bearing spring for automobiles. This spring, which is not materially different in general appearance from the conventional type of leaf spring, is designed to give greater resiliency and wider latitude of movement than the present type. Its chief feature is the roller bearings. Between each pair of leaves is placed a cage of rollers ⅛ inch in diameter ½ inch apart, lying transversely to the spring or parallel to the car's axles. Each leaf works independently of the others and their ends are flanged to prevent side slipping. When resistance is placed upon the spring the rollers serve as a carrier for the leaves, doing away with all friction, and as the spring itself takes all motion, permitting the body of the car to ride without the least noticeable movement and with perfect smoothness, it is said.



The Mercer Roller Bearing Spring.

To guard against the rusting of the rollers and plates, a graphite and anti-rusting packing is placed within the same. The bearings can be applied to any spring.

Westinghouse Charging Receptacle.

The extensive use of electrically operated vehicles and the varied application of storage batteries has created a demand for convenient and durable accessories, one of the most important being a charging receptable that will withstand hard usage and can be handled without danger of short-circuiting the line when inserting or removing the plug.

Westinghouse charging receptacle.

With this idea in mind the Westinghouse Electric and Mfg. Co., Pittsburg, Pa., has developed and placed upon the ma charging receptacle that will meet th rigid requirements.

It consists of a cast metal case, c in form, that occupies a minimum a of space. Within the case are s mounted contacts for receiving the pl hinged lid at one end, held normally by a coiled spring, affords access to t terior. The receptacle being entirely e effectually protects it from dirt and

The plug and contacts within the rec are so designed that it is impossible to a short circuit when inserting or with ing the plug.

Westinghouse charging receptacle with swivel and p

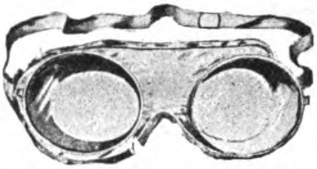
The receptacle may be provided v swivel attachment, conforming to sta railway practice, which is a decided a tage as it admits the pulling out of th when the vehicle starts, the receptacle ing in line with the cable, and allowi plug to pull out without danger of br the cables or contacts.

The charging plug shown in the a panying illustration is intended for us the charging receptacle. It is furnishe or without cables as desired. The co tion is rugged and all parts are well insuring a long period of service.

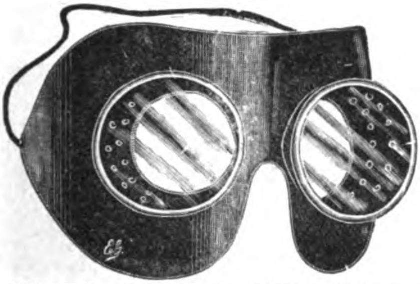
The Persons Mfg. Co., Worcester, are putting on the market in addition t cycle saddles, a clever device for ca luggage on a bicycle or motor cycle consists of two straps 30 inches by ⅝ which buckle on the handle bars. straps are made by experienced leather men of oak tanned leather, have s connections with no rivets and nickel buckles. They can be attached or de in a moment, and when not used c stowed away in a small space.

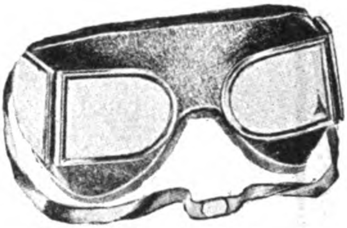
EVERYTHING FOR AUTOMOBILE DEALERS AND OWNERS

Goggles of varied Styles and Prices to Suit Individual Tastes.



We are Importers of the Latest Foreign Patterns



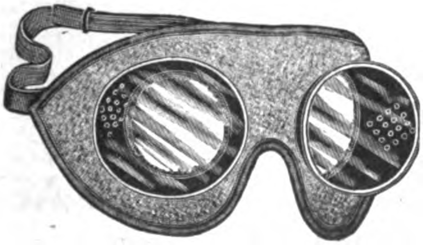


No. 2100. The motor cyclist's favorite. Covers most of the face. Made with black or tan leather, with large funnel shaped eye cups. Bound with chenille. Price, each, $1.00.

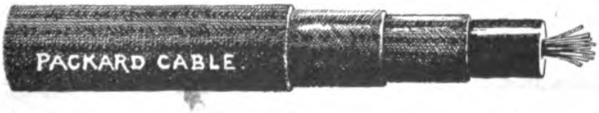
No. 1520. Goggles. Folding metal frame fitted with four glasses, two front and two side vision, mask of tan leather lined with soft white kid, edges bound with silk velvet. Has elastic band with sliding buckle. Will fit any head. Price, each, $1.80. Price, each, with case, $2.30.

The most popular and extensive seller.

Can be folded up, and carried in vest pocket.



No. 2200. Close fitting comfortable goggles made of soft mocha leather. Funnel shaped eye cups. Bound with chenille. Fitted with adjustable strap. Price, each, $1.80.


PACKARD CABLE.

Packard Cable is well known as high class Cable. Is well insulated, will stand severe usage and is very flexible. Made for primary and secondary wiring, also single and two strand. Prices on application.

EXCELSIOR SUPPLY CO.
233-5-7 RANDOLPH ST. CHICAGO.

EVERYTHING FO
DEALERS

DISTRIBUTORS

GENUINE
CONTINENTAL
TIRES

PITTSFIELD
SPARK COILS

WEED'S CHAIN
TIRE GRIPS

MONOGRAM
OILS and GREASES

SOOT PROOF, COMET
and SPITFIRE
SPARK PLUGS

SOLAR and EXCELSIOR
LAMPS

JEWEL
SPARK PLUGS

CARBURETORS
KINGSTON, SCHEBLER
and HOLLEY

SEND FOR CATALOGU

M & M Acid
Cement and Vulcan
"It Sticks"

EXCELSIOR
233-5-7 RANDOLPH S

AUTOMOBILE
AND OWNERS

DISTRIBUTORS

AND
SAVE
MONEY

LAMPS
GRAY & DAVIS
EXCELSIOR

TIRES
GENUINE CONTINENTAL

PLUGS
JEWEL
DE DION "D B"
STA RITE

COILS
PITTSFIELD
SPLITDORF

CABLE
PACKARD
EXCELSIOR

TIRE COVERS

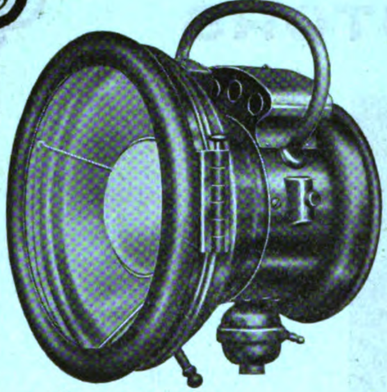
GILBERT
GOGGLES and GLOVES
HORNS and PUMPS
COATS and CAPS
OIL INJECTORS
SPONGES

BARRET "U. S."
SPRINGFIELD and
PEERLESS JACKS
AUTO SPARKERS

Genuine
ABRIEL HORNS
For All Cars

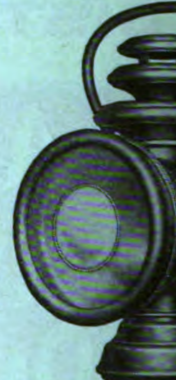
SUPPLY CO.
CHICAGO.

EVERYTHING FO
DEALERS



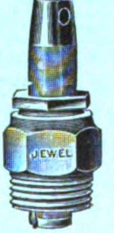
Parabolens Front

Parabolens
Front and
Side Lamps
for All Sizes
of Machines
Latest Designs

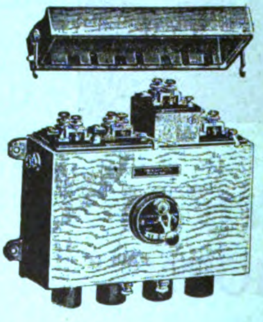


Parabolens Side

Pittsfield Mica Plugs
for All Machines

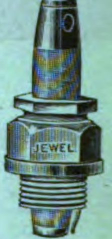


Pittsfield Standard Plug
Low Battery Consumption



Four Cylinder Pittsfield
Dash Coil

Plugs Guarantee
90 Days



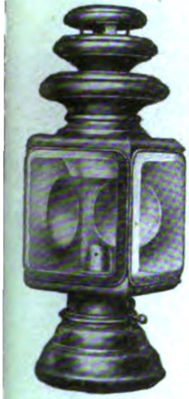
Pittsfield Metric

Coils in Unit Ty

EXCELSIOR

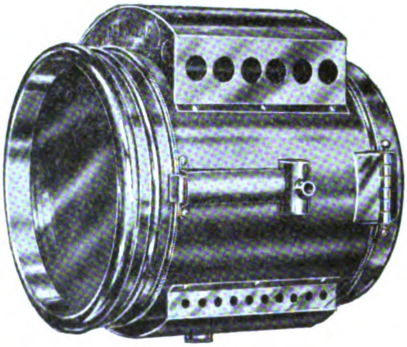
233-5-7 RANDOLPH S

AUTOMOBILE AND OWNERS



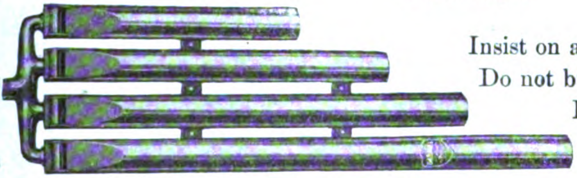
Square Side

1906 Lamps
Searchlights
and Side Lamps
for
Limousene and
Straight Lined
Tonneau Cars



Search Light

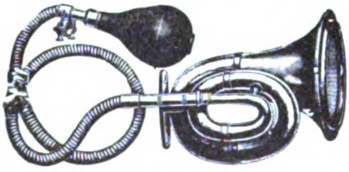
Genuine
Gabriel
Horns
For all
Makes of
Machines



One—Two—Three and Four Tubes

Insist on a genuine
Do not buy an
Imitation

Latest Importations
in Dragon and
Serpentine Horns



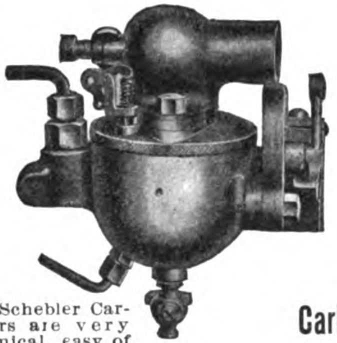
Serpentine Horn

Various Sizes and
Styles in Large
Stock.

SUPPLY CO.

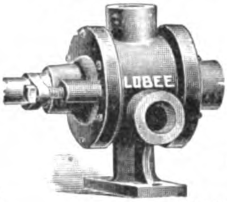
CHICAGO.

EVERYTHING FO
DEALERS



The Schebler Carburetors are very economical, easy of adjustment and run engines up to the highest speed. Write for particulars

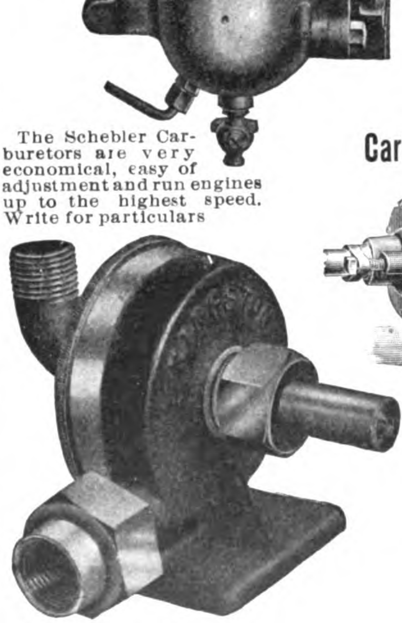
Carburetors and Pumps



The Kingston Carbu
are very reliable, flex
any speed, and not
affected by atmos
changes. Particula
application.

A good circulating pump is a nec
one that is positive in action a
liable.

We are distributors of Lobee, Advance and Kingston Pumps



Kingston Circulating

Advance

EXCELSIOR
233-5-7 RANDOLPH S

AUTOMOBILE AND OWNERS

SPARK PLUGS

Soot Proof

One of the most popular plugs used. Special recess in Porcelain makes it Soot Proof.

List, $1.50.

STA-RITE
DETROIT

Sta-Rite

The well known Sta-Rite Plugs can be furnished in either Mica or Porcelain Core.

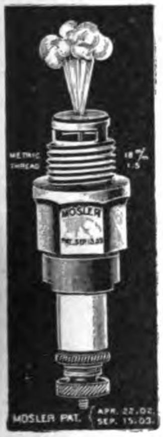
List, $1.50.

Extra for Mica, $1.00.

Jewel

Jewel Plugs maintain their superior construction and high grade Mica insulation. The most used Mica Plug of 1905.

List, $1 50.



Spit-Fire

Spit-Fire Plugs with special construction feature, have projected insulation and sparking points. Very reliable. List, $1.50.

Rajah

Simple in construction, easy to replace porcelain. Porcelains of superior quality. List, $1.35.

Genuine De Dion D B

Genuine De Dion D B Plugs are too well known for description as they are probably the most widely used plugs in the world. List, $1.50.

SUPPLY CO.

CHICAGO.

EVERYTHING FOR AUTOMOBILE DEALERS AND OWNERS

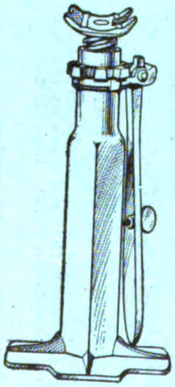
M&M Cement and Acid Cure Solution. It Sticks

Makes repair permanent. Produces vulcanization instantly

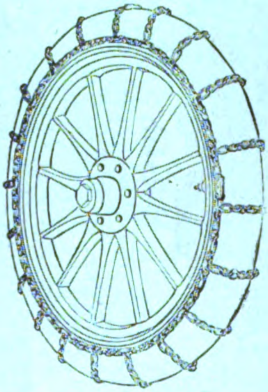
The illustration is of the Special Auto Kit

Every Auto Owner should have one

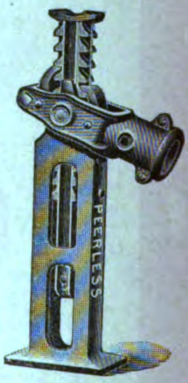
M & M Cement and Acid Cure Solution will do your vulcanizing, etc., and will make it a permanent repair. Will not injure the finest rubber. Made in all sizes. Auto Kit as above illustrated. List, $1.00.



U. S. Jack. Strong, simple, cannot drop. Raises quick. Thoroughly well made.
List, $2.25.



Weed Chain Tire Grips prevent slipping and sliding. Will not injure tires. Very compact. Made for all sizes. Prices on application.



Peerless Jack. Easily operated. Out of the way of springs, etc. Strong and durable.
List, $2.25.

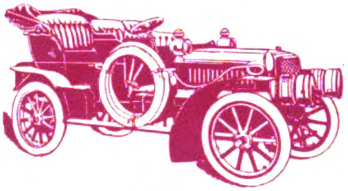
EXCELSIOR SUPPLY C

233-5-7 RANDOLPH ST. CHICAGO.

THE OIL THAT WILL NOT CHAR

PANHARD

Automobile Cylinder OIL



GEORGE A. HAWS

Manufacturer of

Automobile Oils & Greases

73 PINE STREET NEW YORK

TRADE "Nox-All" MARK

MOTOR BOAT
DEPARTMENT OF THE
CYCLE AND AUTOMOBILE TRADE JOURNAL

Contents Motor Boat Department

"Auto-Junior" $125 Launch, Edson Motor Boat Co....... 386
Dubrie 1906 Marine Engines, Dubrie Motor Co........... 394
"Gearless" Boat Reversing Device, Gearless Transmission Co. 393
Holmes Motor Boats and Marine Motors, Holmes Auto Boat Co.. 397
How to Build the Brooks Light Racing Launch at Home —Brooks Motor Boat Mfg. Co....................... 402
Knox 1906 4-Cycle Marine Motor, Camden Anchor-Rockland Machine Co. 392
"Lobee" Bilge Pump, The, Lobee Pump and Machinery Co. 395
Mullins Steel Launches, Mullins, W. H., Co............. 393
"Pequot" Marine Motors, New London Motor Co.......... 400
S. & M. Simplex Hull No. 95, Smith & Mabley Co......... 387
Spaulding Reversible Propeller, Spaulding Engine and Propeller Co., The.. 396
Submerged Exhaust, Submerged Exhaust Co., The........ 408
Superior $200 18-Foot Launch, Lake Shore Engine Works. 395

Index to Motor Boat Advertisers

Camden Anchor-Rockland Machine Co.................... 405
Carlson, Chas. A.. 407
Dubrie Motor Co... 403
Dunn, Walter E.. 401
Edson Boat Co... 401
Godshalk, E. H., & Co................................... 403
Hasbrouck Motor Works................................... 399
Heoule, A. J.. 407
Hildreth Motor Co....................................... 405
Kowalsky, J., Engine Co................................. 407
Lackawanna Valveless Motor Co........................... 405
Lake Shore Engine Works................................. 403
Minn. Boat and Power Works.............................. 407
Neumeister, Fred. P..................................... 405
Nock, Frederic S.. 407
Regal Gasoline Engine Co................................ 407
Terry & Co.. 407
Toquet Motor Co., The................................... 399
Watkins, Frank M.. 401
United Mfg. Co.. 407

Coming Marine Events

January 29-30—Motor boat races at Palm Beach, Fla.

February 20-March 8—National Motor Boat and Sportsman's show, at Madison Square Garden, New York City. J. A. H. Dressel, Manager, 1 Madison avenue, New York.

March 10-17—Boston Motor Boat Show. Mechanics Hall.

March 23-April 8—Annual Regatta at Cannes, France, including motor boat race for Burton Cup.

July 8—Start of the "Paris to the Sea" Motor Boat Race.

July 8—Motor Boat Race for Dubonnet Cup, Nantes, France.

July 10-11—Motor Boat Race on Lower Seine to the Sea, France. Les Sportes, Paris.

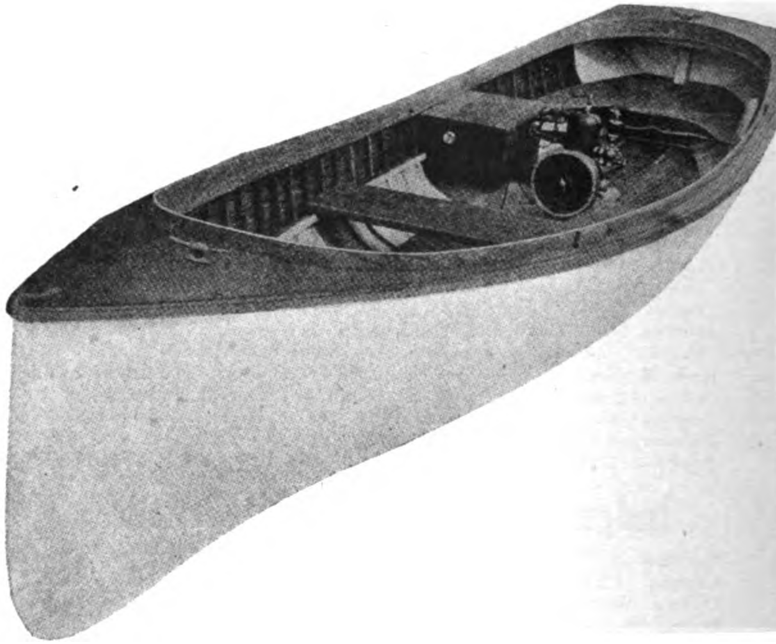
The $125 "Auto-Junior" Launch

To meet the very evident demand for a moderate priced tender and fishing launch, the Edson Motor Boat Co., of Skaneateles, N. Y., have placed on the market a $125 launch, as illustrated herewith. This concern operates a general boat building plant at Mottville, N. Y., where there is ample water power, an important factor in keeping down constructional cost. Early last season they placed upon the market a reliably powered 16-foot square stern launch that has proven its practicability to such a marked degree that they are already building a large stock for 1906, many of which are already booked for delivery.

The hull is of clear cypress, every plank extending from stem to stern without a splice and secured with copper fastenings. Nothing of the rowboat appearance is suggested in any way, as the Auto-Junior has full decks, wide coaming, ample free board and all the points essential to a roomy and comfortable runabout model.

Given an easy entrance forward and ample bearing aft, it is true to water
der load and power, being absolu
from the prevailing tendency c
launches to "squat" under way.

The motor is a 2-cycle of the t
type. It is rated at 1-horse power,
very conservative. Jump spark ig
employed, current being supplied by
teries. Batteries and coil are con
a natural finish locker with hinged c
improved type of fuel tank, air teste
nished, and the engine outfit is com
positive steering device is placed wi
reach of the operator. The rudde
ported by a heavy skeg, which also
protect the propeller. The motor an
ing are finished in aluminum enam
"Auto-Junior" carries about 5 passen
is capable of a speed of about 6
hour.



The "Auto-Junior" Motor Launch. Price $125.

The government dredger, Roberts,
veston, Texas, recently received a l
be used as tender to carry supplies a
pontoons. This launch is 36 feet lon
beam, 2 feet draft, and is equipped
gasoline engine and twin-screw prop

The conditions and rules for the
1906 International Cup race for au
(formerly the Harmsworth Cup ra
adopted at a meeting held Septembe
at Archachon. Copies have been di
by the Motor Yacht Club, 119 Piccad
don. This organization was formerly
rine Motor Club, founded by the
bile Club of Great Britain, and i
of the cup, which is to be comp
annually. Not more than three boat
entered from any one country, each
must be built wholly in the countr
resents, but no limititation is put
form or nature of the motive power

S. & M. Simplex Hull No. 95

THOS. J. FAY, E. E.

An infinitesimal increment is the mathematical measure of the distance from the sublime to the ridiculous; which is another way for saying, to build the fastest purely racing boat that can be constructed within the limitations set down in the racing rules promulgated, and then afford any further effort in the same direction is to take no advantage of the knowledge gained in previous efforts.

There is no doubt whatsoever of the distinct advantages resulting from efforts to design and consurct racing boats. The advantages are two-fold, viz., success in the first effort gratifies the whim of the sportsman, while on the other hand the designers are afforded every opportunity to learn the limits of the strength of the material as well as the value of weight in the right place, considering stability and endurance.

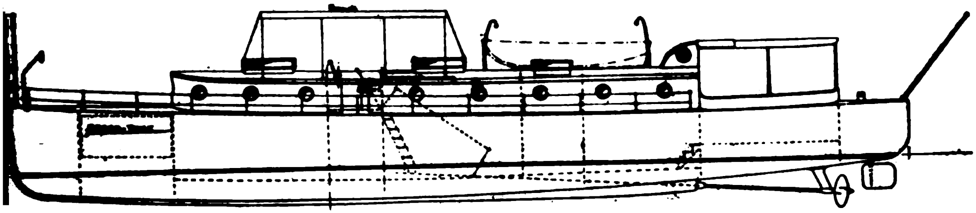


Fig. 1. Profile of S. & M. Simplex Hull, No. 95.

Racing hulls in themselves are of no permanent value, since the limitations put upon them debar their use in other than racing service. Nevertheless, the machinery used in good racing boats is of permanent value since such machinery, provided it serves well in racing service, will suffice for other work, and in all probability will obtain as the future standard.

It is a mistake to assume that designers of racing boats of good endurance are likely to go below the safe limit of weight of the component parts of the machine proper, and it is a mistake to use an excess of material in the working members of the machinery in any case, for in all probability the increase in weight in excess of the proper amount would increase the stresses due to the inertia of the mass.

Advancing in the right direction then, is to at first build successful racing boats, and thereafter proceed to the construction of service boats, having in view the development of the machinery along lines giving the maximum power for a safe weight, not forgetting the while that low cost of maintenance is by far more important than any adjustment of the first cost.

"Hull 95" in the establishment of the Smith & Mabley Manufacturing Company, contemplates something out of the ordinary insofar as motor boat designing is concerned, for while the boat will be speedy, yet even so with an in-overall length of 58 feet and an extreme beam of 10 feet 6 inches, much opportunity is offered towards a display of ingenuity in the arrangements internally rather with the expectation of ending up with a very commodious type of cruising motor boat.

In this boat, as in all products by the same designer, the machinery is looked upon as of paramount importance, hence to describe the machinery in detail will be the purpose here, not, however, to the neglect of the hull, for in all truth, good machinery in a hull of inferior design would be out of place, nevertheless stress is laid upon the fact that the machinery should receive the greatest attention, since as may be readily appreciated, hulls are well understood, for in all truth the boat builders' art is "as old as the hills."

The machinery for motor boats is comparatively a new undertaking and in general not well understood, and it is on this account one may note on every hand fine looking boats that do not seem to serve as well as their books would indicate.

Glancing at the views of the machinery, which for the motor proper is shown in Figs. 3, 4 and 5, it is to note a 75 horse power motor, very compact for the power, free from incongruous attachments and of graceful contour, but these features are merely incidents of no actual value unless the main features are worked out in full accord with the requirements of the service.

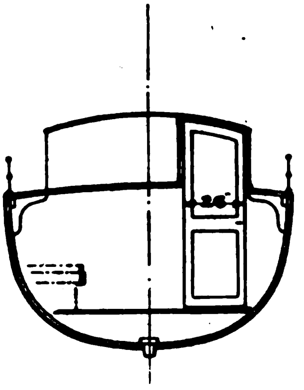


Fig. 1a. Simplex, No. 95, cross section of hull.

In a cruising type of motor boat, safety and endurance as well as adequacy of power are all more important than any attempt at an exterior show at all from the purely art point of view.

In general, it is safe to say a thing is as good as it looks; in other words, a designer who takes pains to make his product look apt, is likely to be capable of making it as apt as it looks.

The distinguishing features about this particular motor are mostly matters of quality of material, scientific accuracy and full power, resultant of details as follows:

MOTOR.

Crank shaft of nickel chrome steel, of ample proportions and very careful design, finished to size so closely as to be interchangeable, and of metal characteristic as follows:

Nickel	4.4
Chromium	1.5
Carbon	0.25
Silicon	0.25
Sulphur	0.012
Phosphorous	0.013
Manganese	0.73

This composition is the average mixture, there being slight variations in the several lots.

Physical properties:

Tensile strength in pounds per square inch	154.000
Elastic limit in pounds per square inch	133,000
Elongation, per cent. in three inches	11
Reduction of area, per cent	25

The various specimens will test up or down slightly from the figures above given, it being impossible to oil temper and anneal in such a way as to effect always the same results:

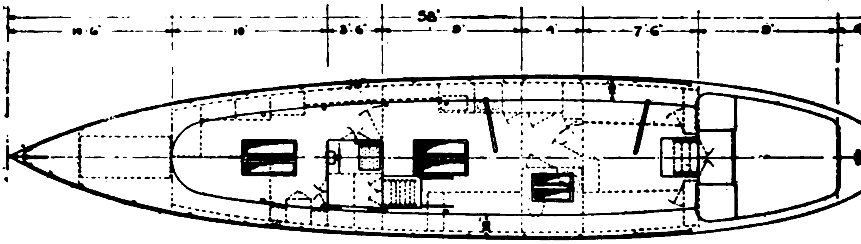


Fig. 2. Simplex, No. 95, plan of hull; length over all, 58 ft.; beam, 10 ft. 6 in.; displacement, tons, load water line, 57 ft.; water line beam, 10 ft.

CONNECTING RODS.

Chemical composition:

Carbon	0.28
Silicon	low
Sulphur	0.019
Phosphorous	0.023
Manganese	0.50

Physical properties:

Tensile strength in pounds per sq. in.	85,000
Elastic limit in pounds per sq. in.	66,000
Elongation, per cent. in two in.	24.5
Reduction of area, per cent	63.3
Fracture	Silky
Texture	Fine
Shock ability	Extraordinary
Section	I
Weight	Very light
Factor of safety	5

This steel is from a special heat by the acid open hearth process, and it is forged at a low heat under an especial arrangement which guarantees a uniform product. Not one single connecting rod of this material ever gave trouble of any sort.

PISTON PINS.

Chemical composition:

Nickel	3.30
Chromium	1.40
Carbon	0.31
Silicon	0.26
Sulphur	0.028
Phosphorous	0.015
Manganese	0.411

Physical properties:

Tensile strength in pounds per sq. in.	233,000
Elastic limit in pounds per sq. in.	221,000
Elongation, per cent. in two in.	6
Reduction of area per cent	40

This metal is first reduced to grinding size, and is thereafter "cemented' for about three hours at a temperature of from 850 to 900 degrees centigrade, thus growing a ized coat about 1-32 of an inch thick is rendered glass hard by squenchin core is then rendered soft by annea hardened pieces to about 570 degre grade.

A Le Chaftelier's pyrometer is e with a view to careful adjustment of perature within the required limits hardened pins are then ground to are pressed into place.

Aside from the press fit, the piston held securely into place by means taper pins, and with a view to ease tating repairs as well, a means is pro readily and quickly removing the lock

CAM SHAFTS.

Chemical composition:

Carbon	
Silicon	
Sulphur	
Phosphorous	
Manganese	

Physical properties:

Tensile strength in pounds per sq. in.	
Elastic limit in pounds per sq. in.	
Elongation, per cent. in two in.	
Fracture	
Cams	
Reduction of area, per cent	

The shape of the exhaust cams that by means of a shifting lever pression is relieved during the ope cranking the motor. The cams are but the remaining portions of the ca are left soft. Two cam shafts are i.e., exhaust and inlet, arranged on sides and driven by enclosed gears.

CAM SHAFT GEARS.

Chemical composition:

Carbon	
Silicon	
Sulphur	
Phosphorous	
Manganese	
Nickel	
Chromium	

Physical properties:

Tensile strength in pounds per sq. in.	
Elastic limit in pounds per sq. in.	
Elongation, per cent. in 8 in.	
Reduction of area, per cent.	

Gear blanks are forged from mill bars, annealed, and thereafter prior to cutting the teeth, which la ation is made on an automatic mac fixed cutters so that uneven teeth possible. All gears are housed in protected against foreign matter. ings are filled with oil, thus assurin lubrication and a silent performanc

VALVES.

Chemical composition:

Carbon	
Silicon	
Sulphur	
Phosphorous	
Manganese	

Physical properties:

Tensile strength in pounds per sq. in......143,000
Elastic limit in pounds per sq. in.......... 70,000
Elongation, per cent. in two in............. 2.6
Reduction of area, per cent.................. 4.8

This special grade of carbon steel possesses properties for use as valves not to be had in any alloy steel. It is free from all the defects of nickel steel, makes a tight seat, and is so rigid as not to deform under the action of heat and the alternate shock stresses to which valves are subjected.

CYLINDERS AND PISTONS.

Chemical composition:

Graphitical carbon 2.80
Combined carbon 0.58
Silicon 1.78
Sulphur 0.165
Phosphorous 0.125
Manganese 0.40

Physical properties:

Tensile strength in pounds per sq. in...... 30,000
Elastic limit in pounds per sq. in.......... 12,000

This mixture is productive of fine strong castings. Cylinders are subjected to a hydrostatic test of 500 pounds per square inch, and are rejected if water seaps through under this pressure. No ordinary mixture of cast iron will withstand this test, nor will ordinary castings afford the strength requisite. The fine cylinder castings used are the result of a vast amount of experimenting, and on the whole a very costly process.

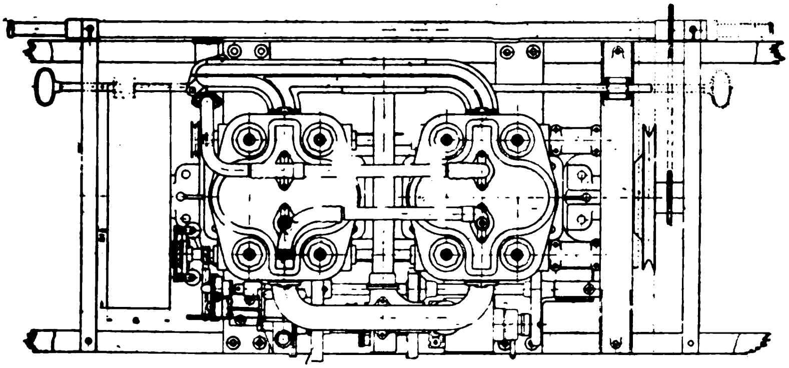


Fig. 3. Simplex, No. 95, plan of 75 H. P. motor.

CRANK CASE.

Chemical composition:

Aluminum 86.79
Copper 4.50
Zinc 7.22
Tin 0.74
Iron 0.59

Physical properties:

Tensile strength in pounds per sq. in...... 22,000
Elastic limit in pounds per sq. in..........Nominal
Elongation, per cent. in two in.............Nominal
Reduction of area, per cent.................Nominal

The remaining details of the motor proper are up to the same standard as hereinbefore set down, and as to the power of the motor, it satisfies the empirical formula:

$$\text{H. P.} = \frac{d2 \text{ x } s \text{ x } n \text{ x } R}{\text{9th power of 10.}} 4 = 74 \text{ ....Fay}$$

= actual horse power in which:
d 2 = square of the cylinder bore in millimeters,
s = stroke of piston in millimeters,
n = number of cylinder,
R = angular velocity of crank-shaft in revolutions per minute.

The torque of the motor measuring at a radius of one foot will then be:

$$P = \frac{\text{H P x 33,000}}{\text{2 Pi R}}$$

$$= \frac{\text{74 x 33,000}}{\text{6.28 x 1,000}} = \text{388.8 pounds.}$$

The speed of the crank shaft then for 75 actual horse power would be:

$$R = \frac{\text{H P x 33,000}}{\text{2 Pi R}}$$

$$= \frac{\text{75 x 33,000}}{\text{6.28 x 388.}} = \text{1014 per minute.}$$

Assuming a constant torque which would be true within the stated limits.

This speed is what might be called "moderate" if compared with the most noteworthy foreign types of motors, yet even so, the speed is high as compared with the old line of American makes of motors.

It must be remembered, however, that foreign motor car builders assumed a leading position for some time, the reason for which was they discovered that by the use of nickel chrome steel in the parts subject to shock stresses, the weight of the moving mass could be cut down to so low a point as to positively limit all fibre strains to a safe maximum, and very materially increase the weight efficiency of the motor. The best foreign practice fixes the weight efficiency at:

$$\frac{715}{60} = \text{11.9 lbs. per horse power for the motor alone.}$$

$$\frac{860}{75} = \text{11.7 lbs. per horse power.}$$

The foreign builders consider it feasible to operate their motors at from 1100 to 1600 revolutions per minute, nor do we know of any reason why to do so would work any harm, whereas on the other hand with suitable proportions of the valves and parts, our weight efficiency would improve with an increase of speed.

We find we are able to produce the power per pound customary with the most modern motors at a more moderate speed than the maximum foreign practice, and prefer to accept the difference as reserve power.

We have noted a very decided tendency in boat performance toward the best results in the matter of propeller efficiency when the performance obtains at a speed between 800 and 1100 revolutions per minute. In other words, it is very difficult to realize a good efficiency in propellers at very high speed, while on the other hand the motor results become inferior at very low speed.

IGNITION.

The ignition is taken care of by the high tension jump spark system in duplicate, excepting that a battery is used as one source of electric supply, while a magneto generator is the remaining method. In this fashion safety and full assurance of at least one means of a well-timed hot spark is amply provided for.

CARBURETION.

This important matter to assure the desired results must be accorded the most careful personal attention at the hands of an expert, even though the carburetor employed is generally good. It is not possible to build stock carburetors, and to place them on motors realizing the desired results, provided the aim is to afford the highest results possible of attainment. As a matter of fact, while the carburetors may all look alike and perform in the same way generally, the most successful performance will depend upon direct personal attention in the matter of the adjustments by one thoroughly acquainted with the equipment.

The carburetor employed in this case is one of the S. & M. Simplex type, in conjunction with a speed governor, so arranged as to facilitate hand control as well.

REVERSE GEAR.

No satisfactory reversing motor of the smaller size has as yet come into vogue, although sizes above 300 horse power are not unknown.

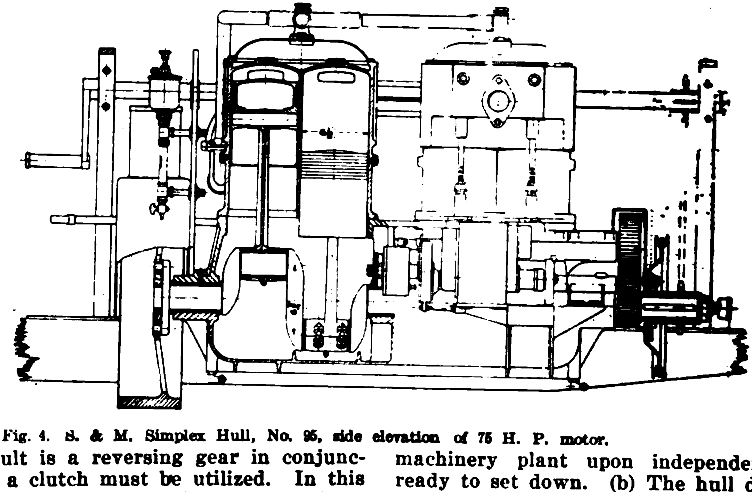


Fig. 4. S. & M. Simplex Hull, No. 95, side elevation of 75 H. P. motor.

The result is a reversing gear in conjunction with a clutch must be utilized. In this case the gear is of the sliding type, direct drive ahead with a metal to metal cone clutch running in oil, not unlike the regular motor car practice.

The single lever control affords ample security against overburdening the operator, and puts a limit on the weight as well.

The reverse gears are of nickel chrome steel as follows:

Nickel	3.38
Chromium	1.87
Carbon	0.24
Silicon	0.183
Sulphur	0.026

Phosphorous ....

Manganese ....

Physical properties:

Tensile strength in pounds per sq. in......1

Elastic limit in pounds per sq. in..........

Elongation, per cent. in eight in...........

Reduction of area, per cent.................

This is the test of the metal as from the mill. After treatment th changes somewhat, it being the desir crease the elastic limit and render face glass hard without reducing the tion of the soft core.

The various other auxiliaries are out in the minutest detail, with the safety, endurance and ease of opera

HULL SPECIFICATIONS.

The details of the hull proper wh are represented in a general way in t Figs. 1 and 2, would seem to merit more attention than the knowledge to glean from an inspection of the vie

Glittering generalities are not so s tory as they sound, hence, to extract t of the subject, it is to set down as ex possible the precise details of the co tion of the hull with scarcely any atte elaboration of any sort. That this me procedure will make dry literature i to be feared, nevertheless the facts brought to light and arranged in logi consistent rotation.

It may not be out of place to here tention to the scheme of design follow with minute exactness by the builders, scheme is as simple as can be, since it involves: (a) A complete and self-co machinery plant upon independent g ready to set down. (b) The hull desig accommodate the machinery, but in its handiwork of the boat builders, who a expected to know about machinery, bu must know all about boats.

The result is: experts in their resp classes of work under the general dir of comptent engineers and naval arch bent on doing everything to be accomp in a harmonious manner.

The hull as hereinafter described ma the sum total of all that can be of a oughly good cruising motor boat, the s cations being as follows:

DIMENSIONS.

Length over all	58 ft.
Extreme beam	10 ft. 6 in.
Displacement	12½ tons.
Load water line	57 ft.
Horse power of motor	75
Water line beam	10 ft.

MATERIAL USED IN HULL CONSTRUCTION.

Keel to be made of white oak, 5 in. x 6 in.; Kelsom to be made of yellow pine; stem to be made of oak knee; stern post and deadwoods to be of yellow pine; timbers to be of oak, steam bent, 1½ in. x 2 in. at the heel and 1½ in. x 1½ in. at the head; and spaced 12 in. centers; transom to be of hackmatac knee; knuckle log to be of oak; floor timbers of oak; clamps to be of yellow pine 2 in. x 4 in.; bilge stringers of yellow pine 1½ in. x 3 in.; deck frames to be of yellow pine 1¼ in. x 2½ in.; shear streak to be of yellow pine 1 in. thick; planking to be of white cedar 1 in., excepting the garboard streak, which is to be of 1¼ in. yellow pine; plank shear to be of 1¼ in. oak; decks to be of white pine laid with 1¼ in. strips and 1¼ in. thick; half round galvanized iron guard around entire hull, size 1½ in.

FASTENINGS OF HULL.

Stem, stern, deadwoods, transoms, timber, floors and engine bed, all to be properly fastened to the keel with composition bronze fastenings.

Planking to be all copper fastened and riveted to the timbers and burred.

Decks to be fastened to deck frame with brass screws.

All fastenings to be countersunk and wood plugged, and the entire hull rubbed to a perfectly smooth finish.

Seams all caulked with best steamboat cotton payed with white lead and puttied flush.

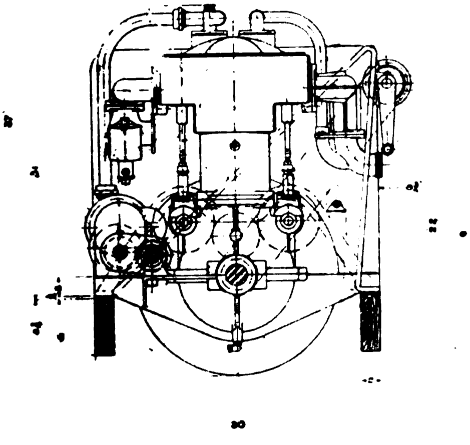


Fig. 5. Simplex, No. 95, end elevation of 75 H. P. motor.

PAINTING OF HULL.

Hull to receive two coats of white lead paint inside, three coats of lead paint outside and two coats of copper paint on bottom to the water line.

Plankshear, shearstreak, decks and outside mouldings to receive three coats of spar varnish finished in natural wood.

DECK HOUSE.

Deck house to be trunk cabin type, with sides of 1¼ in. mahogany, with paneled cabin front at after end, ⅝ in. pine tongue and grooved roofing laid on mahogany carlings, spaced 12 in. centres, covered with canvas, with waterway forming handrails all around deck house. Port lights to be seventeen in number, one dead light opposite bridge on starboard side to be of brome with 9 in. openings set in house, mahogany skylights over forward saloon, engine room and toilet room.

Companion stairway leading to the after cabin, also a companion stairway leading from the engine room to the bridge, the bridge to be equipped with suitable seat and necessary lockers.

AFTER COCKPIT.

After cockpit to be decked with 1¼ in. pine decking, made absolutely water tight, with scuppers, leading out board staved on sides with ⅝ in. beaded mahogany. Mahogany coaming on deck, standing roof of light construction supported upon mahogany stanchions and car lines with two hatches on side, and to be fitted with suitable storm curtains.

FORWARD SALOON.

Forward saloon to have sides, bulkhead, bunk, lockers, drawers finished in mahogany panel work, with bevelled French plate glass mirror extending from the floor to the ceilings, set in bulkhead, and to be furnished with folding lavatory of Sands' make. Ceilings between the mahogany beams to be finished same as forward saloon.

ENGINE ROOM.

Engine room to have sides, lockers, bunks and ceiling finished in mahogany staving and the bulkhead to be finished in mahogany panel work.

GALLEY.

Galleys to be fitted with suitable and approved high class ice box and sink, size and pattern and make to be mutually agreed upon. All open plumbing to be used where possible, and to have tinned copper fresh water tank with a capacity of from 50 to 75 gallons.

TOILET.

Toilet room to have the sides, bulkheads and lockers finished in mahogany panel work, with a beveled edge French plate glass mirror in the bulkhead, with a J. L. Mott & Co.'s patent marine water closet of the best type, and stationary washstand with first-class open plumbing supplied and suitably installed.

AFTER SALOON.

The sides, bulkheads and transoms of the after saloon are to be finished in mahogany panel work with a beveled edge French plate glass mirror in the bulkhead. Ceiling between mahogany beams to be finished same as forward saloon.

All the joiner work is to be finished in natural mahogany, and to have three coats of best varnish, well rubbed to a smooth finish.

FITTINGS.

The fittings to be furnished are to be of such size and quality as to conform with the character of the boat, and to be of the best quality throughout, and to consist of the following:

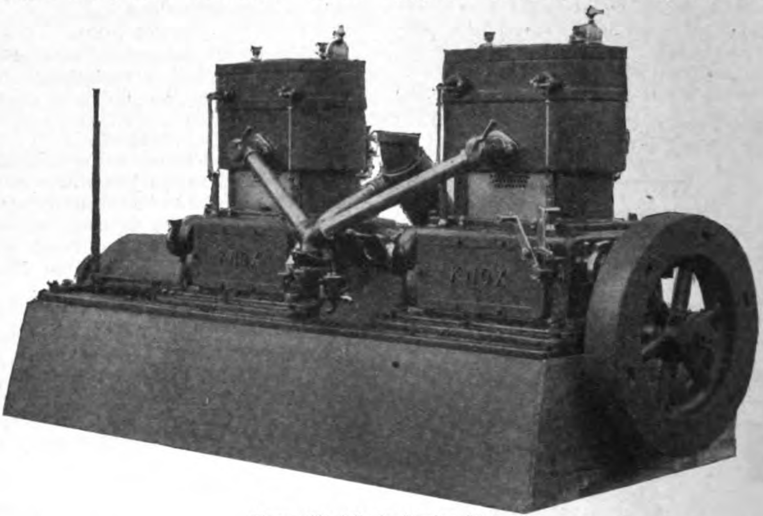
Brass chocks and cleats; brass flag pole sockets; brass hardware, hinges, etc., throughout the entire interior of the boat; manganese bronze rudder and quadrant; brass and mahogany steering wheel; one brass binnacle with 5 in. face, spirit compass; galvanized steel steering cable, to run on ball bearing sheathes, and arrangements made to use a tiller shaft for steering in case; 100 lbs. galvanized anchor, iron, with suitable davit and tackle; 150 ft. 3¼ in. chain or suitable Manila rope; galvanized pipe railing on deck; one set galvanized pipe boat davits complete with suitable tackle; flag poles and boarding stops; suitable bronze capstan or windlass forward; one set sailing lights about 6 in. opening; an oak towing post aft; strong bronze hollow cast "cut water" fitted over the stem of the hull as a stem band or "ram."

Knox 1906 4-Cycle Marine Motor

To meet the demands made on the Camden Anchor-Rockland Motor Boat Co., Rockland, Me., for motors larger than their 13 H. P., 2-cycle marine, that company is now placing on the market their 1906 model, 4-cycle marine motor. The motor is not extremely heavy. No unnecessary material is used. Strength, weight and durability have been carefully considered in its construction.

Exhaust and inlet valves are made of nickel steel, and they are located so that they may be easily removed without disturbing the other parts of the engine. They are all interchangeable and mechanically operated, running in long, water-cooled guides on water-cooled seats.

Cam shaft, cams and all gears are located in the crank chamber. They are automatically oiled, and readily accessible by removing hand hole plate. All wearing parts are made of forged steel, case hardened. Gears on crank and cam shafts are made of forged steel, the intermediate gears are made of special bronze.



Knox 1906 4-Cycle Marine Motor.

Wrist pin brasses are made of phosphor-bronze; crank pin boxes are made of bronze lined with special copper hardened metal. Both of these are so arranged that the wear can be easily taken up. End bearings bushings and centre bearing bushings are extremely long, and are made of special copper hardened metal adjustable for wear.

The carburetor is a duplicate of the one used on their two cycle motors. It is automatic, has float feed, and has been in successful operation for years. The gasoline reservoir is fitted with a sight feed glass, which enables the operator to see at a glance whether it is available for use, and also whether it is held at the proper level for the proper mixture.

The ignition is the make and break principle. The plug contains both stationary and movable electrodes, easily removed from the cylinder head. The igniter is operated directly
from cam shaft. The firing points ar
from special alloy, and are adjustab
removable. The time of ignition on al
ders is controlled by one hand lever,
allows the speed of the engine to be co
at the will of the operator, making a
range of speed possible.

The compression is relieved by mea
single hand lever acting on the e
valve, which allows the fly wheel to be
turned when starting engine.

The speed of engine is regulated by
of a rotary throttle valve, which a
down the amount of fuel in proportion
speed. The automatic governor preve
engine from racing when load is thro

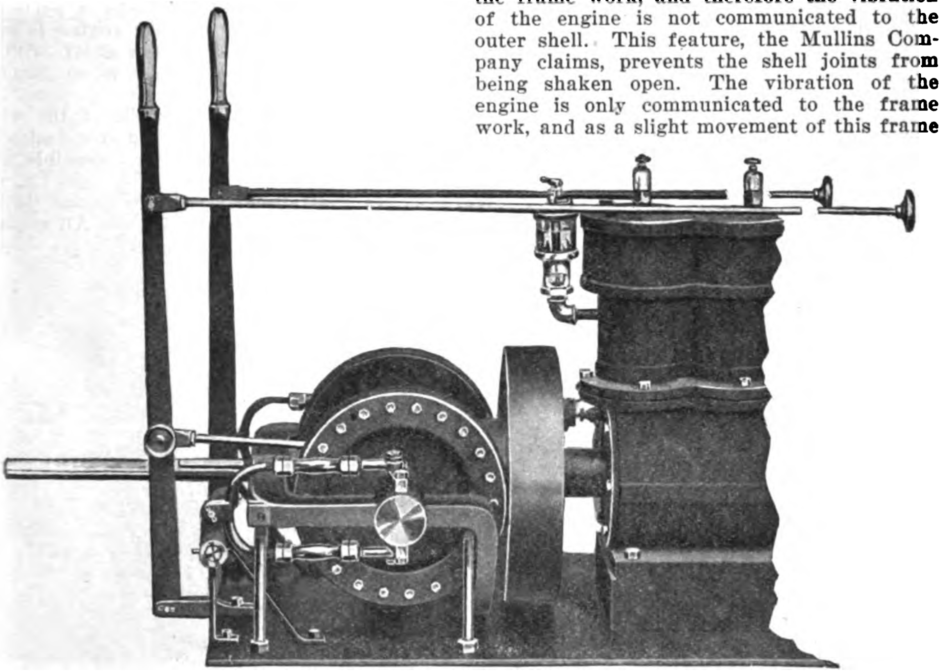
Cylinder heads, cylinders and valve
bers are all water-jacketed. The e
pipes are water-jacketed to the base
engine.

The reverse gear is mounted on o
plate with engine, and is really a part
engine. It is operated by one lever
mechanism runs in oil and is housed
oil-tight case. When engine is runnin
reverse gear may be easily examine
adjusted by simply opening the case.
propeller can be made to drive the b
either direction, or it may be in
stopped. In the go-ahead motion the r
gear is locked, the gears not operati
revolving with the shaft. When backi
propeller has the same speed as when
ahead.

The Albany Yacht Club, Albany,
has purchased the five-story building
State Street pier, which it has occup
some time, for $3,000. The building,
has been fitted with steam heat and
furnished, will be kept open during the
year. It is convenient for either a clu
or boathouse, being within five minutes
of the city's business centre. The cl
grown rapidly since occupying this b
and now has over 200 members, with
including 40 motorboats.

"Gearless" Boat Reversing Device.

The "Gearless" transmission which was described in our October issue, page 158, can also be applied to motor boat use, and the manufacturers, Gearless Transmission Co., Glens Falls, N. Y., are making an effort to interest the marine trade in the same. With this transmission, drive is direct on high speed, and side discs are not in operation. To vary the speed, the disc on the driving shaft is moved forward and backward to and from the centre of the discs at the sides. The flywheel bears against the faces of the side discs, the sides of these discs in turn bearing against the face of the drive shaft disc, one on each side. This gear can be operated from the rear of the boat or from a forward position in the boat.



"Gearless" Transmission in a Motor Boat.

Mullins' Steel Launches.

W. H. Mullins Co., of Salem, Ohio, are putting out a line of motor boats with steel hull construction, one of which, an 18-ft. launch, is shown herewith. The hulls of these boats are built of smooth steel plates and are designed on correct scientific lines. This company uses a different method of construction from that used by other steel hull makers.

18-Foot Mullins Steel Launch.

A feature of the Mullins construction is the fact that the outer shell, or planking, is entirely independent of the inner frame work or rib skeleton, the shell being attached to the frame work only at the keel, stem, stern posts and along the gunwales. The shell is not nailed or in any other way secured to the frame work, and therefore the vibration of the engine is not communicated to the outer shell. This feature, the Mullins Company claims, prevents the shell joints from being shaken open. The vibration of the engine is only communicated to the frame work, and as a slight movement of this frame work is possible within the shell the pulsations are absorbed by it and not communicated to the shell.

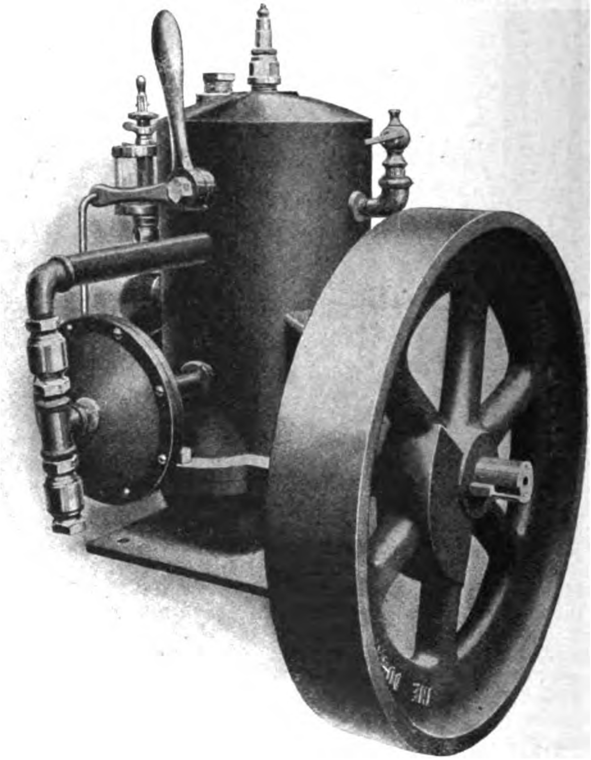
The frame work of these boats is of the best selected oak. The ribs are steam bent so as to exactly fit the inside of the shell. These ribs pass through the heavy oak keel, and altogether the construction is both strong and rigid. The outer shell is of large pressed steel plates, which are made in immense cast steel dies perfectly true to form. All boats made from the same dies are exact duplicates. They guarantee that any of these boats will withstand hard usage such as will put a wooden hull of double the weight out of commission. Large air tight compartments are fitted in each end of the boat, of sufficient capacity to safely float the boat, together with its occupants, in case of accident.

They install a motor of their own design, which they guarantee. Their new catalog describing both launches and engines will be ready for distribution about Jan. 15.

Dubrie 1906 Marine Engines.

Several 1906 models are offered by The Dubrie Motor Co., 34 Brush Street, Detroit, Mich., manufacturers of 2-cycle gasoline motors, motor boats, etc. A very popular one of these engines is the 2 H. P. model which has a cylinder bore of 3½ inches and a piston stroke of 3 inches. The head is cast integral and there is a 5-8 inch water-jacket over the head and around the cylinder walls. This large water-jacket keeps the engine extremely cool and at a very even temperature.

The piston on the up stroke is within 3-8 of an inch of the walls of the cylinder head, which raises the compression to 110 pounds cold air. This extremely high compression makes the engine very light on fuel and gives wonderfully high speed, besides eliminating base firing.



"Dubrie" 2 H. P. Marine Motor.

The exhaust is 1¼ inches. The cylinder is split at the bottom so that crank case and cylinder bolt together only in the one place, directly through the center of crank, making it extremely easy to take up the wear in bearings should any occur.

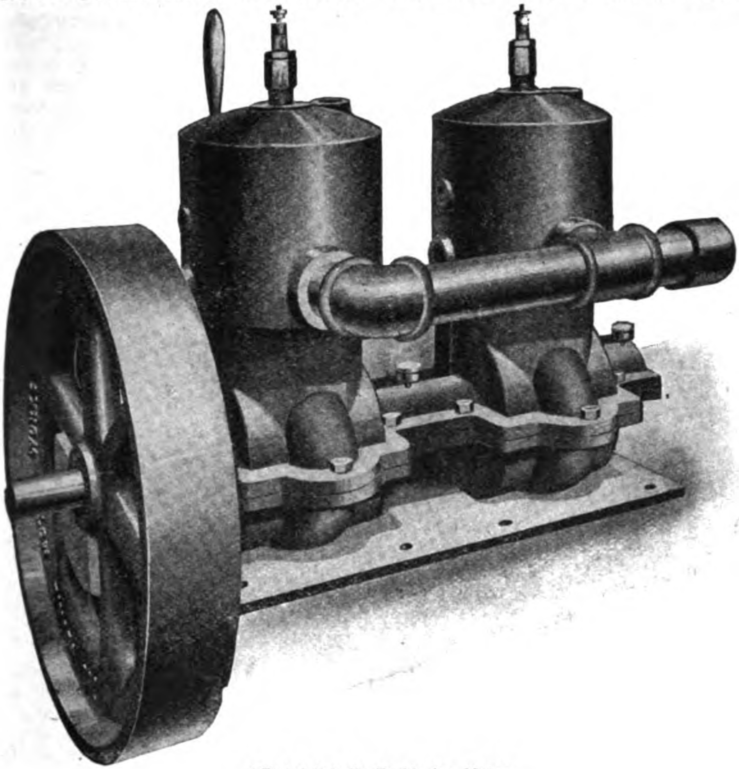
The cylinders are all reamed and pistons are reground, making a very good fit. The pistons are fitted with two rings, turned eccentric, are 3-8 inch wide, ¼ inch thick at the thickest point, making the cylinder perfectly tight at all times.

The connecting rod is fastened on the piston pin with a bolt tapped through one side of the take-up and locked with a nut and fastened with a cotter pin so that i possibly jar loose. The connectin 2 inches on the crank shaft bearing bitted and is fastened with lock nuts ter pin the same as the head. T shaft is 1 1-8 inches in diameter, drop forged steel, and finished under crometer. The fly-wheel is 12 inches eter, by 2½ inches face. It has a balance on the hub which keeps it steady at whatever speed the engin The wheel is pressed on the shaft hydraulic press, so that there is no chance for it to become loose.

The commutator on engine is of type, is controlled from the top of cy lever which is always perfectly access has fine control.

The entire weight of the engin pounds, including all accessories. Al are finished in "Dubrie" green unle wise ordered, an exceptionally hig that will stand a wonderful amount The entire outfit consists of engine, p shaft, starting crank, spark plug, sp one set of batteries, stuffing box and everything necessary for installing with the exception of the gasoline ta outfit sells for $75.00. One of these is the one that won the Country Club Lake St. Claire last September. Th was installed in a 20 foot skiff, and little better than 11 miles an hour.

They also offer a three horse powe This engine is similar in design to orse power, has the same stroke but an inch rger bore. The bore of the cylinder of the hree horse power is 4½ inches, stroke 3 nches. It has extremely heavy bearings and vill run at a very high speed. The entire utfit weighs 110 pounds and sells for $85.00.



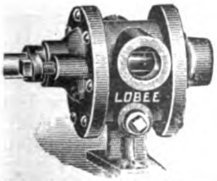
"Dubrie" 5 H. P. Marine Motor.

The "Dubrie" five horse power is of ouble cylinder form. This motor has been esigned especially for motor boat work, runs a normal speed of 1000 R. P. M., and is xtremely light. With its high speed it is an eal motor for small motor boats. This out- consists of all boat attachments with the xception of the gasoline tank and retails for 50.00.

They have also 100 horse power motor built pecially for motor boat work. This engine s four cylinders, each having a bore of 7 ches, and a stroke of 6 inches. It weighs 0 pounds, runs at a speed of 800 R. P. M., d retails at $1000.00.

The "Lobee" Bilge Pump

Lobee Pump and Machinery Co., 140-152 errace, Buffalo, N. Y., whose circulation pumps are well known to the automobile trade, have recently brought out a bilge pump which is made in three sizes, ½ in., ¾ in. and 1 in. suction and discharge. Besides being adapted to pumping the bilge out of launches and motor boats it can also be conveniently used for washing down decks or for a circulation pump, and can be run in either direction. This pump is simple in construction and is giving entire satisfaction in actual use, we are informed. There is nothing to get out of order and they do not clog up should any foreign substance get into them.

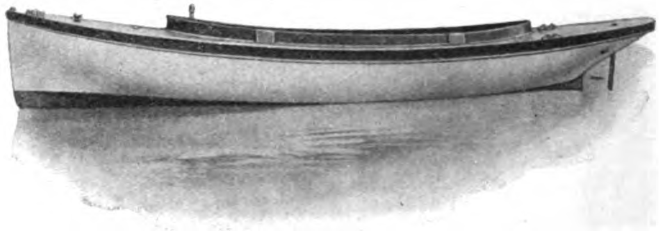


The "Lobee" Bilge Pump.

Superior $200, 18 Foot Launch.

As a leader for 1906 Lake Shore Engine Works, Marquette, Mich., are offering an 18 foot launch for $200 which appears to be exceptionally good value. It is made in fan-tail or compromise stern type as desired, and is carvel built and caulked throughout. The keel and keelson are of clear white oak. The ribs are of the same material and steam bent. They are fastened to the keel by galvanized iron screws and traced by a white oak floor timber fastened to the ribs on each side. Stem and stern pieces are of clear white oak, also the deadwoods. Deck timbers are of oak or ash and the floor of pine. The planking is in Louisiana cypress, seasoned white cedar or white pine. Garboard strake is of white oak. Hull is fastened with galvanized nails and screws. Sheerstrake and covering boards are of clear white oak; coaming of ash or oak, steam bent to shape, with moulding at bottom. Fender rails are of clear white oak; Sheerstrake and covering boards fastened with galvanized iron nails and screws, heads plugged with white oak plugs. Decks are of alternate strips of butternut and cedar, blind fastened with king board of clear white oak. A solid oak deck is laid if desired. Seats along each side are provided with lockers for supplies, and raised lockers are placed on each side opposite the engine for batteries, spark coil, tools, etc. Inside of hull is sheathed with white pine ceiling. Bulkheads are placed at bow and stern.

Inside of planking, frame timbers, seats and floor are given two coats of paint. The exterior of the hull, from fender rail down, is given three coats of white paint. All upper works, including fender rails, decks, coaming, etc., are finished in oil and spar varnish.

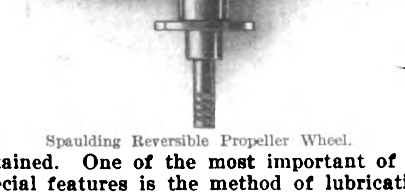

"Superior" 18-ft. launch, price $200. Beam amidships, 4 ft. 8 in.; depth at bow, 31 in.; depth
stern, 31 in.; depth amidships, 24 in.; cockpit, 11 ft. 6 in. by 4 ft.; draft at shoe, 15 in.; seating capac
10; speed, 8 miles per hour.

Cleats, chocks, flag pole sockets and cap for gasoline tank pipe are of polished brass. The steering wheel is of oak, finished in oil and spar varnish. The tiller rope runs underneath covering board and is fastened to rudder arm under deck. Rudder, shoe and stem iron are of steel. Tank is of galvanized iron, with partitions, and is of fifteen gallons capacity.

A Standard 3 H. P. "New Superior" reversible motor and three blade bronze propeller are installed, complete, ready to run. Necessary wrenches and oil can, one-half gallon cylinder oil and can, and instruction book for the operation of the engine are all furnished with the launch.

Spaulding Reversible Propeller

The Spaulding Engine & Propeller Co., St. Joseph, Mich., are putting out a reversible propeller wheel in which, by careful attention to all details, great efficiency has been obtained. One of the most important of its special features is the method of lubrication of the stern bearing and hub. A compression grease cup is placed at any convenient place


Spaulding Reversible Propeller Wheel.

in the stern of the boat attached to
¼-in. tube which leads to the stern
the bearing being bored and tapped t
odate this tube. By forcing grease
stern bearing it thoroughly lubric
thrust and all the working parts
wheel which are there encased. This
makes the wheel practicable in fresh
water. Other features of this prop
the reversing of a solid shaft, the pl
the strain against the outside of t
and the sand and water-proof hub.

The usual difficulty with reversi
peller wheels arises from the lodg
obstructions in the sleeve tube which
the reverse mechanism and the ina
the hub to withstand the wear and
sand, dirt and weeds that collect
point. In the Spaulding wheel this s
trouble is eliminated by the use of
shaft, no sleeve tube being used. T
throws the thrust on the stern bearin
at this point is taken up on the ske
boat, thereby relieving the engine b
strain. To reverse the blades the so
is moved backward or forward. Th
are made of the finest quality bronze
quickly and easily replaced if necess

The propeller shaft is attached to
gine shaft by a special coupling
each end. The coupling is keyed sol
engine shaft and keyed loose to the
shaft, permitting the propeller sha
moved backward or forward about
shifting the position of the blades.

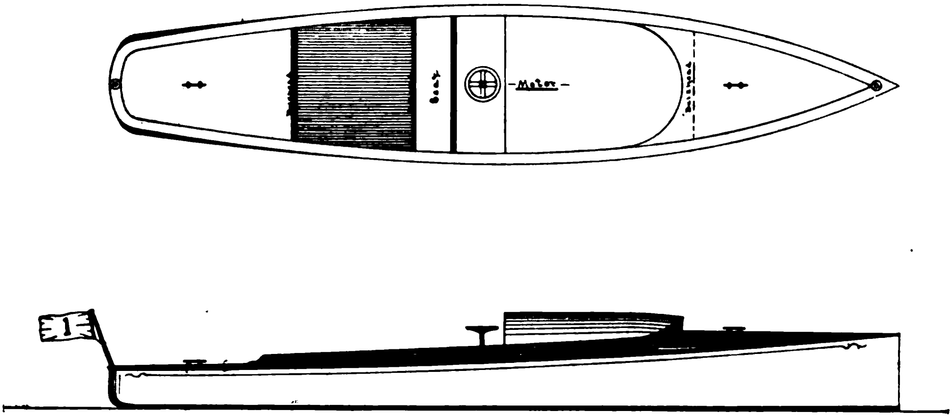
The reverse lever is placed betw
collars which are keyed solid to the
shaft. The lever is not connected
but engages one or the other of th
when shifting the position of the
The wheel and parts are finished in
machine and to standard gauge,
perfect fitting of repairs.

Another motor boat carnival, pron
Fred Sterry, secretary and treasure
Palm Beach Power Boat Association
held on Lake Worth, Palm Beach,
The executive committee is compose
Gould Brokaw, lieutenant; Hugh
loughby, Leland Sterry, John S. Cl
D. Proctor Smith and Theodore
Wells, of 32 Broadway, New York, c
There will be many Florida built boa
the speedy craft that will participat
race.

The triple show number to be issued Febr
be another record breaker. Don't miss it, se
subscription promptly on blank you will find o

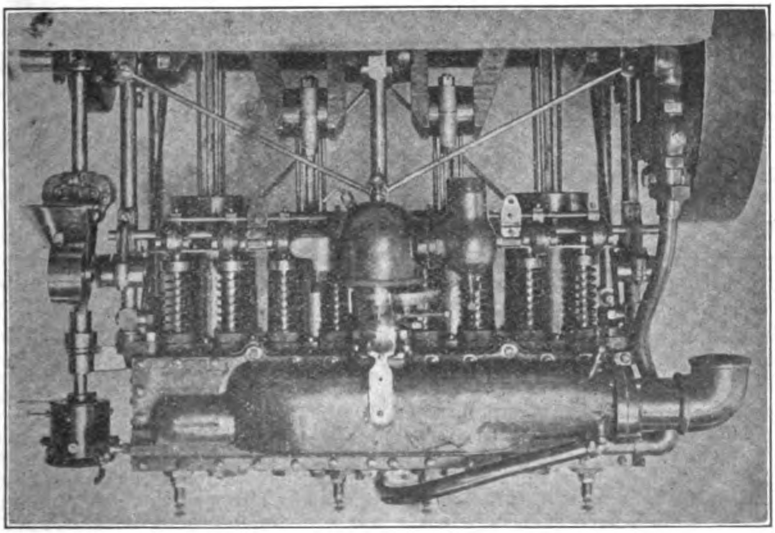
Holmes Motor Boats and Marine Motors

Holmes Auto Boat Co., West Mystic, Conn., are the builders of the auto yacht tender "Blue Peter," here shown, and are also putting out this season a 20-ft. boat of the one design class. The latter is of sectional construction, unsinkable, and equipped with a two-cylinder, two-cycle light weight motor. It is guaranteed capable of a speed of thirteen miles per hour.



Plan and side views of Holmes Auto Boat Co's 20x40 ft. one design non-sinkable boat; equipped with double cylinder 2-cycle engine; weight of engine, about 150 lbs.; weight of boat, about 450 lbs.; boat can be carried on davits of a yacht; price, $490; guaranteed to do 13 miles per hour; a useful craft with good speed and an excellent sea boat.

This company also manufactures the Holmes marine motor here illlustrated. It operates on the 4-cycle plan, has a long piston stroke and an open base. It is an engine of medium light weight, very strong and rigid construction, adapted to both light and heavy service. It is very flexible in control and runs smooth and steady with scarcely any perceptible vibration at 200 revolutions, slow speed, up to 1000 revolutions, high speed. It shows, by actual test, unusual power for its size, especially at slow to medium speeds, 500 to 700 r. p. m.



The Holmes Auto Marine Engine.

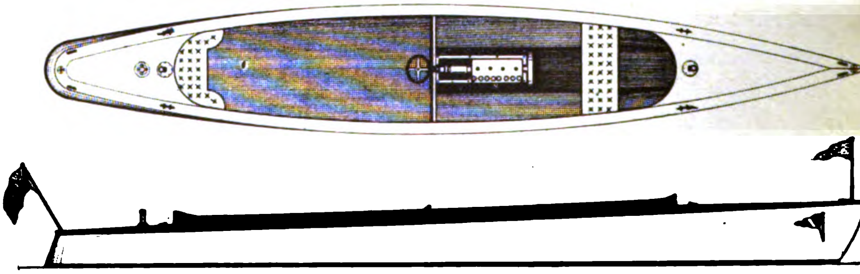
The cylinders are cast in pairs with solid heads, so that no gaskets are required, and are bolted together, having a combination inlet, exhaust and inlet-water bronze casting bolted along the valve side of same, thereby doing away with many unsightly, bothersome pipes and insuring, by this condensed arrangement, more uniform carburation, hence steady smooth running, regardless of atmospheric conditions.

The cylinders are easily removable from balance of engine without upsetting same. They are set up and supported on stancions, set wide apart, with broad base, all very strong and rigidly braced, leaving base of engine all open and accessible. Every bearing, even the piston pin, can be instantly reached. This arrangement affords good ventilation, insuring cool running conditions. Oiling is done by an automatic positive mechanical system.

The valves, all mechanically operated, are as large in area as could possibly be used. They are worked from adjustable lifters, directly over a solid cam shaft that is driven from a half-time upright shaft, which in turn is driven by worm gears from crank shaft. The upright shaft carries the governor, also the secondary timer for jump spark, which, with single vibrating coil, are all together on front of engine where the least amount of wiring possible is required. For racing purposes a second timer can be added with a separate set of spark plugs.

"Blue Peter," a 32-foot double planked yacht tender made by Holmes Auto Boat Co., which has sho
speed of about 19 miles per hour; has a 20 H. P. Holmes motor turning 700 r. p. m.

The water circulation is first around the exhaust valves and over top of cylinder heads then around cylinders, and out at centre, in one return pipe to exhaust. Automatic drainage is provided as a precaution against freezing.



Plan and side view of Holmes Auto Boat Co.'s 32x5 ft. "Blue Peter," built as a yacht tender
hoist out and carry on davits. Boat is divided into six separate compartments by five water-tig
bulkheads; all mahogany, double plank deck, fastened with brass screws; equipped with a Holmes Au
Marine Engine turning up a 32-in. pitch wheel, 700 revolutions; has shown about 19 miles, actual p
formance over an accurate 5280-foot course; her rating is 50.8 (A. P. B. A.), and actual weight wi
two men aboard about 2500 lbs; is controlled and operated same as an automobile; engine runs wi
scarcely any perceptible vibration, and the exhaust is noiseless and odorless; boat could turn over a
not sink.

Starting is effected by a handle on front end of shaft. One or two half turns, with compression slightly relieved is sufficient. Frequently after the first start all that is necessary is to throw in the switch.

The fly wheel is bolted to a collar on rear end of crank shaft, which has large two-inch main bearings and wrists. All gears are covered by guards. Relief and priming cups have connecting handles. Ball thrust bearings are fitted on upright shaft. Large, easily removable, plates are provided ov
and sides of water jacket. The pisto
inches and the stroke 6¼ inches. The
develops 20 horse power at 700 r. p.
at 900 revolutions. The flywheel is 18
diameter.

Length over all is 34½ inches. W
bed plate 16⅛ inches. Height, ce
shaft to top of cylinder, 21⅛ inches.
including fly wheel, 460 pounds.

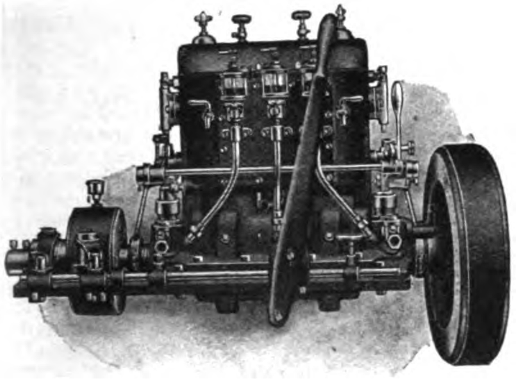
The boat "Blue Peter" is fitted wi
of these engines and shows a speed of
nineteen miles per hour.

Its dimensions are 32 feet length o
5 feet extreme beam; 12 inches drau
hull; 26-in. draught under propeller;
freeboard at bow, 17-in. at stern; le
cockpit over all 19.4 in.; cockpit aft
10 feet.

The hull is divided into six separa
tions by five watertight bulkheads b
which each section is longitudinally t
diagonally strapped, and strongly brac
space under fore and aft deck is bulk
forming two air compartments suffic
float boat with load, when all other s
may have filled with water.

This construction makes a very stro
easily accessible fore and aft, and ab
non-sinkable with but little additional
The hoist out shackles are arranged
direct from keel to deck through soli

The Toquet Marine Motors



"The Plus Motors"

The sustained popularity of the Toquet has been earned by a conscientious attention to details of construction. Our Motors develop 25% more than the rated power hence the term "The Plus Motor."

Send 3 two cent stamps for Catalog.

We have 1906 models in stock for immediate delivery, and want agents in unoccupied territory.

The Toquet Motor Co. **G. EDUARD SHAW** General Manager
No. 314 Fourth Ave., New York City, U. S. A.
Cable Address, Toqumotor, N. Y.

HASBROUCK MOTORS

The experiences and testimony of the men who buy and use marine engines is the best safeguard and guarantee that can be offered prospective purchasers. Read below the comments of men who know:

Office Board of Assessors, No. 320 Broadway.

New York, July 31, 1905.

Hasbrouck Motor Works,
New London, Conn.

Gentlemen:

I have just returned from a four weeks cruise in my launch "Shawna," having gone from New York to Lake Champlain and back. The boat is driven by a 16 h. p Hasbrouck motor, and during the time I was away it did not give me a bit of trouble or cause a minute's delay. It never failed to start instantly or to run as long as it was asked to go.

Yours very truly,
(Signed) GEO. C. SUTTON.

Extract from letter of Lancelot Copleston. New York Office, No. 39 Cortlandt St., Watertown Engine Co., Engines and Boilers.

New York, December 20, 1905.

Hasbrouck Motor Works,
New London, Conn.

Gentlemen:

I have looked over your motor very critically from the standpoint of an old marine engineer, and I am going to say that there are a good many points that you have covered more or less, improvements in themselves, and it showed to me you had a good designer and someone that surely knew something about marine work around salt water.

Yours truly,
(Signed) L. COPLESTON.

CORRESPONDENCE SOLICITED

THE HASBROUCK MOTOR WORKS, Inc.
155 Water St., New London, Conn. NEAR N.Y., N. H. & H. STATION

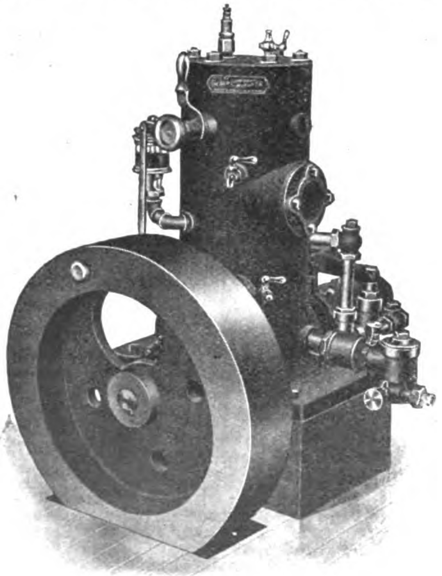
heads. The coamings are round at each end. A towing bitt is provided in the after deck. The hull is double planked white cedar, with a layer of canvas between; decks are built the same, with mahogany top, having wide covering boards. The frames are of Connecticut oak, steam bent, in one piece, spaced about three inches apart through bottom of hull, copper, brass and bronze fastened throughout.

The coamings, seats, ceiling, moldings and all inside finish are in mahogany. The outside of hull is painted a dull Columbia white with bronze bottom, while all mahogany work is given a smooth, bright or dull finish. The equipment includes a bronze auto steering device connected by flexible bronze rope and brass turnbuckles through brass pulleys and guides to a bronze balanced rudder with tailshaft bearing. Polished brass cleats, chocks, flag sockets and towing bitt, with two ash flag-poles, are fitted.

The regular gosoline tank is within the watertight bulkhead seat across front end of cockpit. Two extra gasoline tanks that can be used as air compartments are placed under raised platforms at each side of motor. The space under motor is copper lined.

"Pequot" Marine Motors.

The Pequot Motor is manufactured by the New London Motor Company, of New London, Conn., and is a simple, economical and reliable motor of the two-cycle type, built of the best material by competent and careful workmen, under rigid inspection.



The "Pequot" Marine Motor

The 1906 models will consist of the following sizes: 3½, 5½ and 8 horse power, single cylinder; 8 and 12 horse power, double cylinder. The motors are designed with good liberal bearing surfaces and with all parts of sufficient weight to withstand lon hard usage, without being excessively The descriptive data below applies to t horse power motor. Its bore is 4 in., 4 in., weight 200 lbs., and it shows u brake test 4¼ horse power at 600 revol per minute. It will handle a 16 in., two- wheel at from 600 to 650 revolutio minute. Ignition is by the jump spark od, with a non-vibrator coil.

The timer used is novel in that it g quick break no matter which way th gine is running, nor is it effected by wa oil in any way. The pump, instead of located, as is so commonly done, back balance wheel, is placed at the back an side of motor, where it is easily gott It is operated with an eccentric and arm entirely independent of the sparki vice, and is of such a construction th plunger, which has a bearing at both t bottom ends, is given a partial turn a stroke, which in combination with the bearing prevents its rapidly wearing Water connections between the pum cylinder are made with a slip joint, can be easily taken apart and put ba ways coming tight no matter what th ditions existing.

The New London Motor Company taken such care in the proportioning ports, crank case, compression space a flector that their motors run quietly and omically at a high speed. The Pequo tors run equally well in either directio the speed can be varied instantly from mum to maximum by either spark or t control.

Marine Trade Notes.

After months of experimenting and the Hasbrouck Motor Works, New L Conn., formerly at West Mystic, Conn. perfected a marine kerosene motor, will be made in sizes from 10 to 300 This concern will also soon put out a 2-cycle engines for the smaller trade.

The Michigan Steel Boat Co., whi votes its energies to the manufacture o hull launches, have started a new co under the name of "Detroit Boat Com which will make wooden launches excl in 16, 18, 21, 25 and 30 foot lengths new company expects to turn out abou of these launches during the coming

In addition to automobile lamps, Th munds & Jones Mfg. Co., 315 Riopelle Detroit, Mich., are now making moto lamps and whistles. These, which ar made in accordance with the gover regulation requirements, are well const and made of the best materials. T motor boat lamp is constructed wit white bull's-eye glass in the front, the starboard and green on the port The whistles are hand power operate have a far-reaching shrill sound.

Don't risk missing the triple show number to b February 1. Send in your subscription now. Subs blank on page 444.

WATKINS MARINE ENGINES ARE NOT EXCELLED

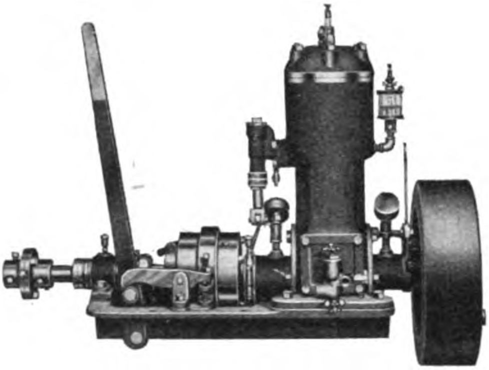
In quality of material.

In perfection of workmanship.

In solidity and strength.

In ease of operation, and

In convenience.



In beauty of design.

In correctness of proportion.

In extreme limit of durability.

In everything that goes to make a first-class engine.

You cannot get a better at any price

Write for our free catalog

THE FRANK M. WATKINS MFG. CO.

528-538 Baymiller Street, Cincinnati, Ohio

CYCLE AND AUTOMOBILE TRADE JOURNAL

$1.00 A YEAR

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CYCLE AND AUTOMOBILE TRADE JOURNAL

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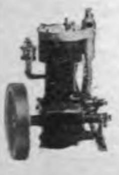
1213 FILBERT ST. PHILADA.



THE "DUNN" MARINE MOTOR **$42.50** FOUR CYCLE REVERSIBLE Outfit Complete

This high power 4-cycle motor with "bet" coil, batteries, shaft, screw. tanks and muffler' tested ready to install in skiff or launch. Weight of motor 100 lbs. I also build two and three- cylinder stationary motors.

Bore 3¾ in. Stroke 4 in.

1¾ H. P. actual.

WALTER E. DUNN
OGDENSBURG - NEW YORK

THE AUTO-JUNIOR $125 LAUNCH

Made good in 1905.
Better for 1906.

Edson Boat Co.
Box 226
SKANEATELES, N. Y.

How to Build the Brooks Light Racing Launch at H

The cuts herewith illustrate the various stages of the work of building a light racing launch hull at home, and after the various parts are cut to proper shape and size any person of ordinary intelligence can do the work of assembling as here illustrated. The boat under consideration is 22 feet long and of 44-inch beam width. Its depths are 24 inches at bow, 19 inches amidships and 16 inches at stern. It draws 14 to 18 inches of water. The cock pit can be made from 14 to 16 feet long and will provide seating for 5 to 7 persons.

Below we give the material needed to construct this boat, but pieces which are to be 20 or 22 feet long can be spliced where material of such length is not obtainable, and instructions for splicing are given in this article. Following is a statement of the materials required:

WHITE OAK, FIR OR ROCK ELM.

One piece 22 ft. long, 8 in. wide, ⅞ in. thick, for keel; one piece 4 ft. long, 16 in. wide, ⅞ in. thick, for transom; one piece 4 ft. long, 7 in. wide, 1⅞ in. thick, for stem and stem-knee; one piece 3 ft. long, 5 in. wide, 2⅞ in. thick, for shaft-log; two pieces 14 ft. long, 12 in. wide, ⅞ in. thick, for deck-beams and floor-timbers; two pieces 14 ft. long, 6 in. wide, ⅝ in. thick, for sides of coaming; one piece 8 ft. long, 6 in. wide, ⅝ in. thick, for ends of coaming; 90 running ft., 2 in. wide, ⅞ in. thick, for clamps and bilge stringers; 140 running ft., ⅞x⅝, for the ribs; 45 running ft. of ⅞ in. half-round for fender-wales.

PINE, CYPRESS, CEDAR, FIR OR SPRUCE.

Two pieces 20 ft. long, 10 in. wide, ⅝ in. thick, for inside bottom plank; two pieces 15 ft. long, 8 in. wide, ⅝ in. thick, for outside bottom plank; two pieces 22 ft. long, 12 in. wide, ⅝ in. thick, for lower side plank No. 1; two pieces 22 ft. long, 12 in. wide, ⅝ in. thick, for upper side plank No. 3; two pieces 22 ft. long, 15 in. wide, ⅝ in. thick, for middle side plank No. 2.

HARDWARE.

Three lbs. 1½ in. clout nails for planking sides; 3 lbs. 1¾ in. clout nails for planking bottom; 2 lbs. 6 penny casing nails for fastening lower edge of bottom, and for ends of floor-timbers; a couple of 10 penny casing nails for the forward end of the clamps; 1 lb. of 1½ in. brads for fastening deck; 2 doz. 2 in. No. 12 screws, for fastening deck-beams; 15 doz. 1½ in. No. 12 screws, for fastening ribs, floor-timbers, etc.; 2 doz. 1¼ in. No. 12 screws for fastening transom, cleats, etc.; 16 ¼ in. tire or carriage bolts, 2¼ in. long, for fastening the keel splice; two ¼ in. tire or carriage bolts, 7½ in. long, for fastening the stem to stem-knee; one ¼ in. tire or carriage bolt, 5 in. long, and one 3½ in. long, for fastening stem-knee to the keel; four ¼ in. carriage or tire bolts, 4 in. long, for fastening the transom-knee; sand paper, putty and paint. If boat is to be used in salt water, use brass bolts and copper nails.

A claw hammer, clinch iron, rip saw, smooth plane, block plane, screw driver, one-half inch chisel, three iron clamp screws of five inch opening, plumb bob and line, two saw horses about 20 inches high, bit stock, No. 4 German bit, ¼ inch bit and a countersink for bitstock will be required in making this hull.

To make the keel, mark out its outline on the 22 foot piece called for in the materials, and mark lines across keel at places where the moulds come, being careful to get them exactly in place.

If the keel has been made in two pieces,
it will be spiced by putting a butt b
the upper side as shown in Fig. 2
butt block is of oak of the same th
and width of the keel, and about 12

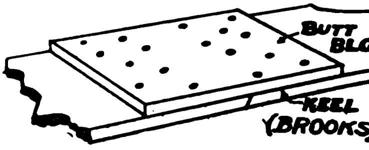


Fig. 2. Showing how to splice the keel if san
two pieces.

long. It is fastened in place with
¼ inch tire or carriage bolts, 2¼ inche
or the splice may be fastened with th
number of 1½ inch No. 12 screws.

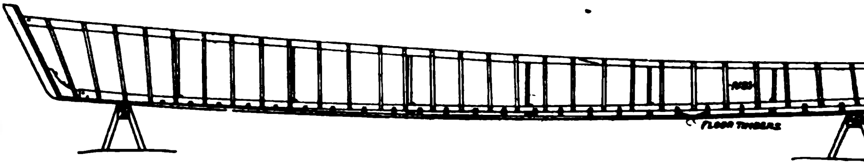


Fig. 1. Frame of Brooks 22-ft. light racing launch.

Cut stem and stem-knee to shape a
the two parts together with two carr
tire bolts, as shown in Fig 3. Before
in these bolts file the heads on two sid
countersink with the filed sides of th
parallel with the outer edge of the
Cut the rabbet in the stem ⅝ of a
deep and make the outer edge of th
¾ of an inch thick. Fasten the ste
to the keel with two tire or carriag
as shown in Fig. 3.

Cut the transom to shape and cut th
som-knee out of oak 1⅞ inches thick
ten the transom to the transom-kne
two bolts, and fasten the transom-k
the keel with two bolts. Fasten the
the keel to the transom with four 1
wire nails.

The moulds shown herewith are ten
forms, used to get the shape of the
therefore any rough lumber may b
to make them, it being only necessar
their outer edge be exactly shaped
moulds may be made of 4 or 6 inch
and fastened together as shown in Fig
corners being cut out to allow of the
and bilge stringer laying in so as to b
with the outside of the mould. The
six moulds in this boat. The cuts sho
of each, that is, they only illustrate o
of the mould, to the centre line. Ho
all the measurements for the moulds
obtained from the patterns, and wh
moulds are finished they can be prov
rect by trying the patterns on one si
then turning the pattern over and tr
on the other side of each mould.

To set up frame, set the keel o
horses as shown in Fig. 1, letting the
sag down five inches below the ends
may get this accurately by stretching a

2 H. P. $75.00
4 H. P. 100.00

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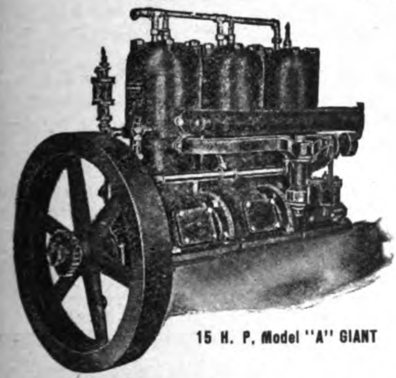

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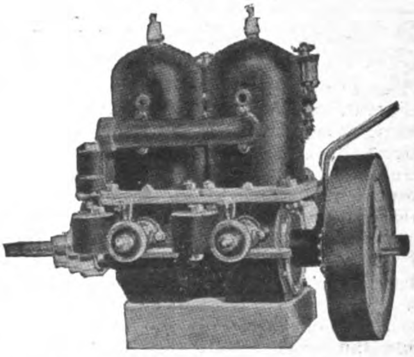


"NEW SUPERIOR" MOTORS

over the keel, from end to end of keel, and then springing down the keel until it measures 5 inches from the string to the keel, in the middle. Block the keel in this position. Set the moulds in their stations. Then fasten and brace the stem, moulds and transom.

There is only one stop-water in this boat, located between the end of the keel and the stem, as shown in Fig. 3.

The clamps are sprung in place in the notches at the top of the moulds.

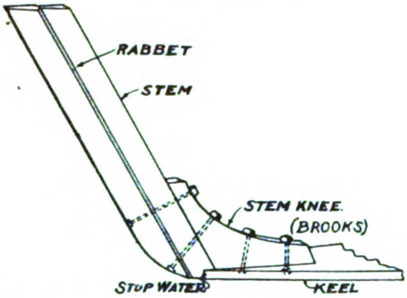


Fig. 3. Stem and stem knee of Brooks light racing launch, showing how these parts and the keel are fastened together.

The forward end of the clamps are beveled and brought together against the back of the stem, as shown in Fig. 8. The two ends of the clamps are fastened together with three 1¼ inch No. 12 screws, two of them from one side, and one from the other, as shown in the illustration. The ends of the clamps are fastened to the stem with two ten-penny casing nails, slanted down through the clamps into the stem as shown.

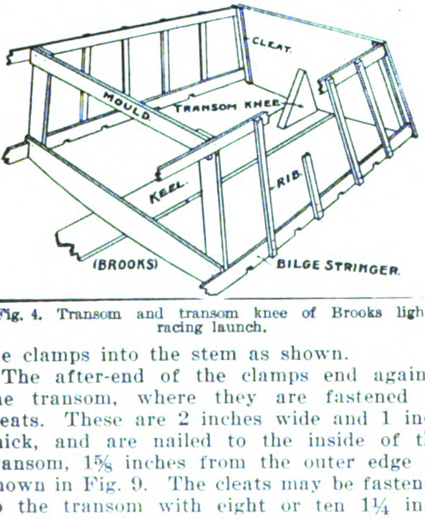


Fig. 4. Transom and transom knee of Brooks light racing launch.

The after-end of the clamps end against the transom, where they are fastened to cleats. These are 2 inches wide and 1 inch thick, and are nailed to the inside of the transom, 1⅝ inches from the outer edge as shown in Fig. 9. The cleats may be fastened to the transom with eight or ten 1¼ inch screws. The ends of the clamps are fastened to the cleats with two 1½ inch screws. The after ends of the clamps are flush with the top of the transom, but are ¾ of an inch from the outer edge of it. This is so that, when the ribs are put in, they will come flush with the edge of the transom.

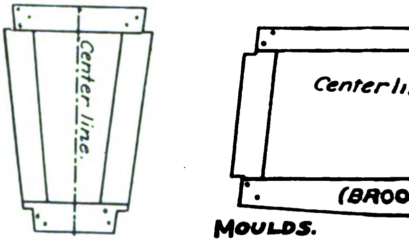
The clamps may be temporarily held in place at each mould with a small nail.

On account of the length of the m
it will probably be necessary to pu
clamp in with two pieces. When this i
the splice is made by putting a butt
12 inches long and the same size
clamp, on the outside, over the splic
tening it to the clamp with 1¼ inch
screws.

The bilge-stringers fit into the botto
ners of the moulds, the same as th
into the clamps at the top. The forwa
of the bilge-stringers are beveled off a
tened to the side of the stem-knee wi
1¼ inch screws as shown in Fig. 10.

The after end of the bilge-stringer
against the transom, and are faste
the bottom of the cleat the same
clamps, and when necessary, they are
in the same way. The end of the
stringers come flush with the bottom
transom, but are ¾ of an inch (or the
ness of the ribs) inside the outer edge
transom.

The ribs or side timbers are up and
pieces on the outside, that extend fr
bottom of the bilge-stringer to the top
clamp, as shown in Fig. 1. They are
9 inches from centre to centre of ea
are fastened with two 1½ inch No. 12
at each end of each piece, as shown
last two or three ribs on each end a
placed straight up and down, but are
so as to equally divide the extra
caused by the angle of the stem and t
These ribs are simply straight pieces
sawed off flush with the top of the
and the bottom of the bilge-stringers.



Figs. 5 and 6. Moulds used to get the shape
boat.

The floor timbers are all sawed ou
the one pattern. There is one floor
half way between each of the ribs
timbers. The floor timbers are faste
top of the keel in the middle, with t
inch screws to each, the ends of th
timbers are morticed into the lower
the bilge-stringers and are fastened w
six-penny nail at each end, up throu
floor timber into the bilge-stringer. S
1.

Where the floor timbers lay on top
keel, they are slightly flattened wi
plane, so as to lay flat on the keel.

Get out and put on the top streak
of planking. After cutting out one si
the patterns, use it for a pattern to
the plank for the opposite side. Ap
plank up to place on the stem, and y
tell just how much to trim out of the

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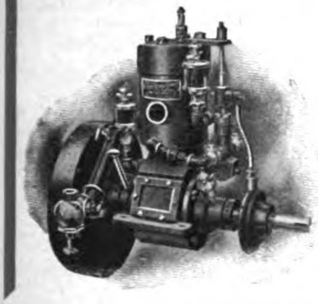

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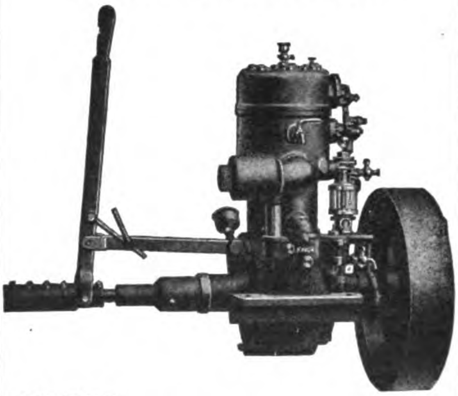

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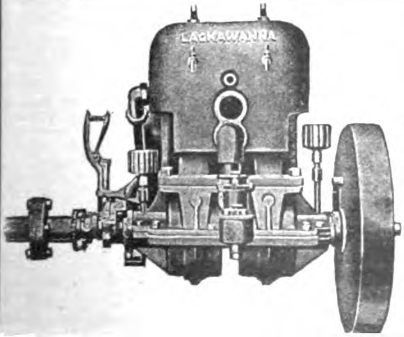

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to let the plank in flush. Fasten the plank to the stem with three or four 1½ inch clout nails, and to each rib, with three 1½ inch clout nails.

Where the plank butt or splice, they are fastened by putting a butt block of oak, 8 inches long and the width of the plank, by ¾ of an inch thick, on the inside. Fasten the plank to the butt block with one dozen nails. This butt block is the same as is shown in Fig. 2. Next, put on No. 2 plank, making the seam between planks tight on the inside, and a little open, ⅛ of an inch, on the outside for caulking. After the two top streaks of planking are on, turn the boat over, and, commencing with the bottom plank next to keel, put it on, using 1¾ clout nails to fasten the bottom plank to the floor timbers. Next, put on the outside bottom plank, using same nails; then put on the lower side plank (No. 3). This is fastened to the ribs with 1½ inch clout nails, and its bottom edge is fastened to the outer edge of the bottom with six-penny casing nails put through the lower edge of the plank into the edge of the bottom. This seam between the side and the bottom should be made tight, as it is not to be caulked. The casing nails from the side into the bottom are spaced close together, from 1½ to 2 inches apart.

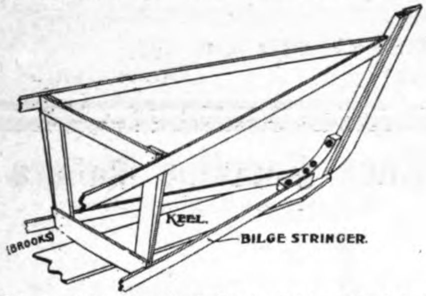


Fig. 7. Forward end of Brooks light racing launch hull frame.

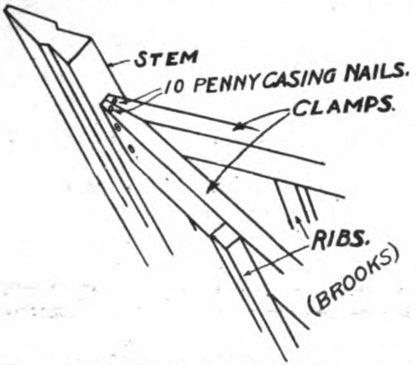


Fig. 8. Illustration of how the forward ends of the clamps are brought together against the back of the stem.

After the boat has been planked, turn it over and put in the deck beams. Saw out the seven beams for the forward end from the one pattern. Saw out the four beams for the after end from another pattern, showing less crown. The deck beams are placed one between each rib, and are fastened to the clamp by morticing out one-h width of the beam from the top of the and one-half the width of the bean the bottom of the beam itself. This the beam in with its top flush with of the clamps, as shown in Fig. 1 ends of every deck beam are fastened clamp with one 2 inch screw.

The two side pieces that form the are fitted in place and fastened to th as shown in Fig. 11, using 1¼ inch

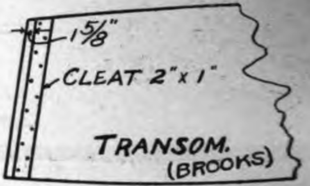


Fig. 9. Cleats to which are fastened the a of the clamps. These cleats are fastened to t som by screws.

The engine bed is usually made 12 inches apart. The end pieces of th ing are simply gotten out straight an across the end. When put in, the pieces should be about 9 inches wide. they are fastened, they may be scr conform to the height of the coami the crown of the deck. The corners coaming are reinforced by fitting a quarter-round in each, on the inside. pieces of oak, 2 inches thick. The fore and aft and are notched over t timbers. The top of the bed timb dressed down to conform with the a the shaft. The size of these timbe their distance apart will, of cours with different engines. The bed timb fastened to the bottom with 1½ inch put up through the bottom, into the b bers.

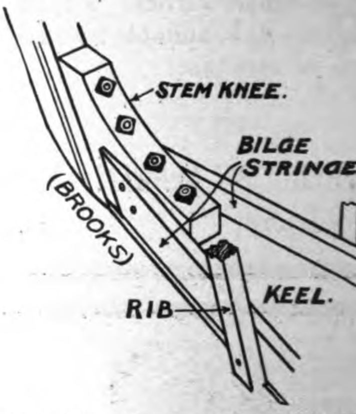
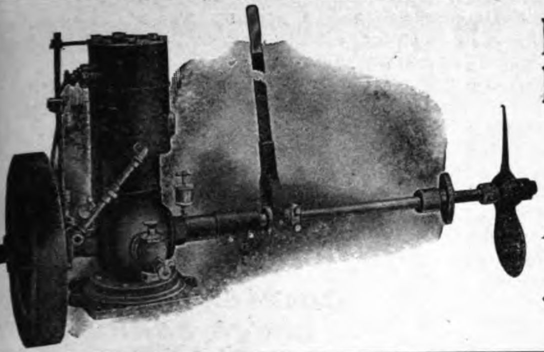


Fig. 10. Bilge stringers and the method of ing same to stem knee in Brooks light racing

The shaft log is cut out of 3 inch o is fastened in place on the keel at t tion shown on the keel pattern. Th log is fitted down onto the keel. T timbers are cut out to allow the s to go down on the keel. Fit the s to the keel and fasten in place with



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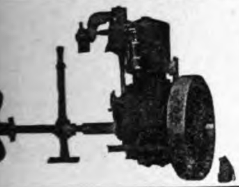

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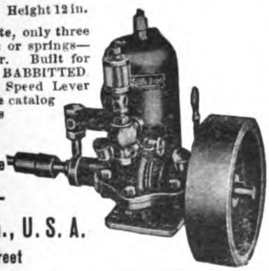

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screws, up through the bottom into the shaft log. Before putting in the shaft log, fit a piece of canvas, laid in white lead paint, between it and the keel, and when putting in the screws, be careful not to get any of them in the way of the shaft hole.

The rudder shoe should be made of bar iron, one inch or more square. There is an up and down bracket between the shoe and the bottom of the boat, which carries a box that is babbited to support the outer end of the shaft. This work will of course vary and will be made by each builder to conform to the particular engine he is using.

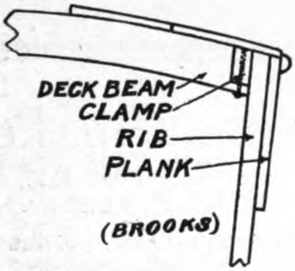

Fig. 12. Deck beam fastening in the Brooks light racing launch.

The fender-wale is a half-round strip that is put on the outside, with its top edge flush with the top edge of the boat. It is fastened in place with 6-penny casing nails. See Fig. 12.

The seats in this boat had best be put athwartships, the same as a row boat. They may be located to suit owner's taste. The seats should be made of ⅞ inch lumber and be from 12 to 14 inches wide. The sides on the inside may be panneled up, or finished with narrow strips, or left as it is and painted.

To finish the outside of the boat, set in all
nails, and plane and sand paper
then give a priming coat of paint,
nail heads; then give two or three
paint.

These instructions are furnished
terns for all parts of the boat b
Motor Boat Mfg. Co., of Bay Cit
who furnish patterns and instruc
all kinds of boats. Besides the sp
structions for each boat, as for exa
above instructions for a light racin

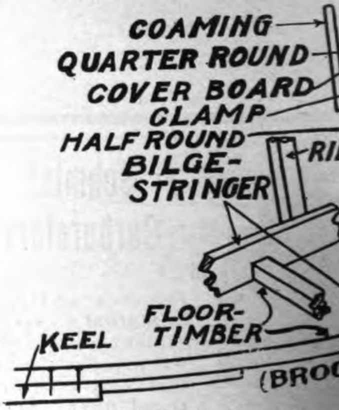

Fig. 11. Floor timbers, ribs, bilge stringers, etc., and the method of fastening sam
Brooks light racing launch.

they give with each set of patterns
instruction sheet, which describes
every necessary operation, so that t
can build the boat. The patterns
light racing launch sell for only $5
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and the special instructions as gi
with, enable one to build the boa
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way having its largest end in front.
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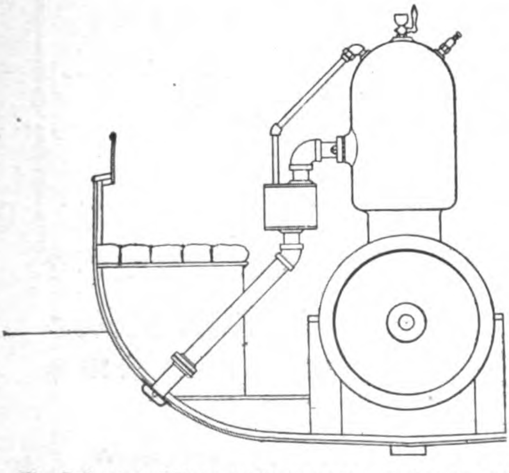
exhaust by the forward motion of
and creates a suction which draw
haust from the engine and preve
pressure.



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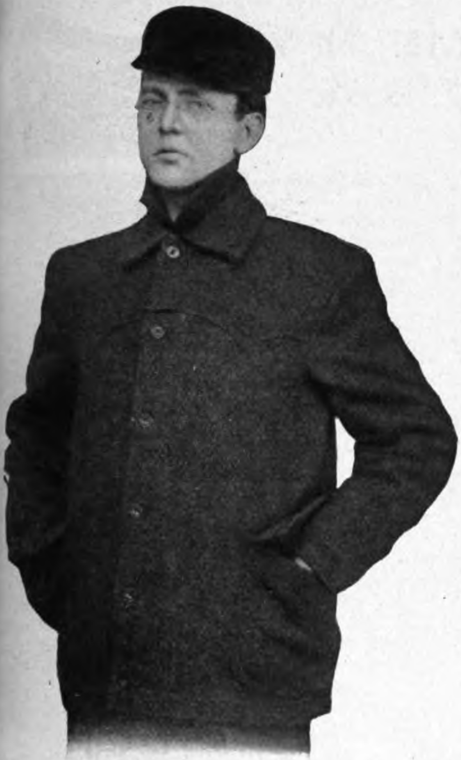

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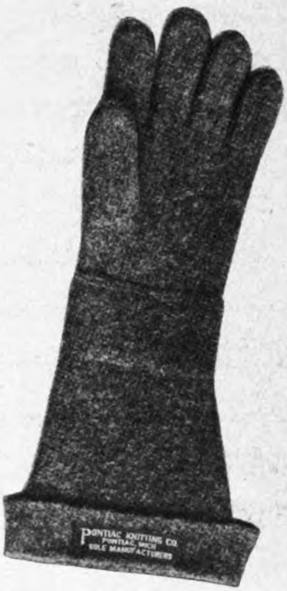

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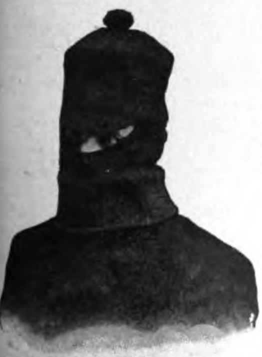

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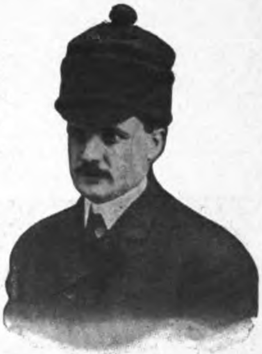

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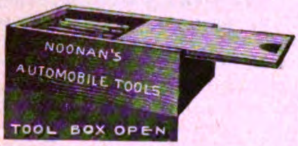
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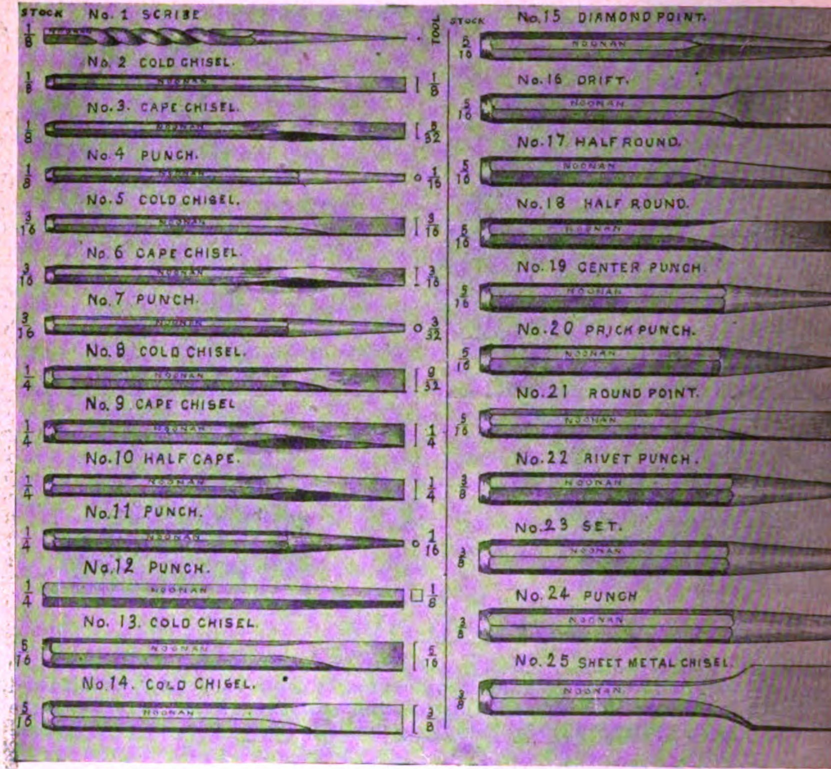
TOOL BOX OPEN

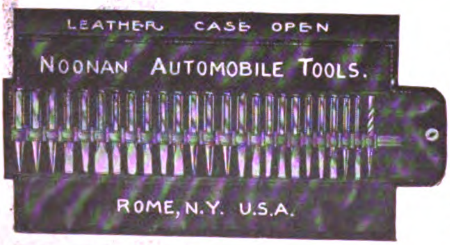
ROME, N. Y.
U. S. A.

LEATHER CASE CL


STOCK
TOOL
No. 1 SCRIBE
No. 2 COLD CHISEL.
No. 3. CAPE CHISEL.
No. 4 PUNCH.
No. 5 COLD CHISEL.
No. 6 CAPE CHISEL.
No. 7 PUNCH.
No. 8 COLD CHISEL.
No. 9 CAPE CHISEL
No. 10 HALF CAPE.
No. 11 PUNCH.
No. 12 PUNCH.
No. 13. COLD CHISEL.
No. 14. COLD CHISEL.
No. 15 DIAMOND POINT.
No. 16 DRIFT.
No. 17 HALF ROUND.
No. 18 HALF ROUND.
No. 19 CENTER PUNCH.
No. 20 PRICK PUNCH.
No. 21 ROUND POINT.
No. 22 RIVET PUNCH.
No. 23 SET.
No. 24 PUNCH
No. 25 SHEET METAL CHISEL.
NOONAN

SET	CONSISTS OF NOS.	Size	Length	Tool Box
No. 1	1 to 25 inclusive.	⅛-⅜	4 inch	$3.00
" 3	1, 5, 7, 9, 10, 12, 14, 19, 22, 23,	⅛-⅜	4 inch	1.25
" 2	2, 3, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24, 25,	¼-⅜	6 inch	3.00
" 4	9, 11, 12, 13, 14, 15, 16, 19, 21, 25.	¼-⅜	6 inch	2.15

Six Inch Tools Made of Larger Stock According


LEATHER CASE OPEN
NOONAN AUTOMOBILE TOOLS.
ROME, N.Y. U.S.A.

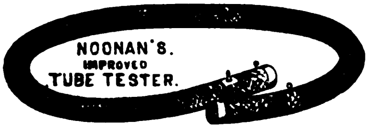
No Tools made equal to

NOONAN'

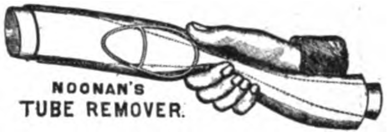
Must be seen to be appreciate

Beware of imitations. See that the of Noonan, Rome, N. Y., is stamp every tool.

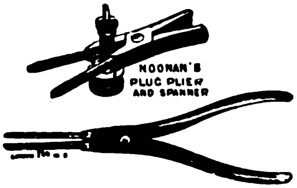
A Few Tools and Specialties That have a World-Wide Reputation


NOONAN'S.
IMPROVED
TUBE TESTER.

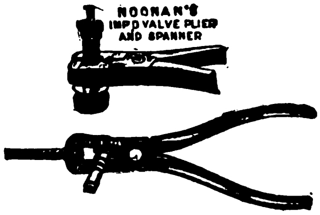
PRICE, $2.00. A perfect inner tube tester, more durable, simple and perfect than anything ever before produced.


NOONAN'S
TUBE REMOVER.

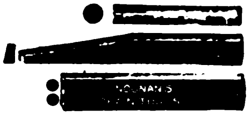
PRICE, 10c. No sticking of the tube inside the shoe with this tube remover. One size fits all tires.


NOONAN'S
PLUG PLIER
AND SPANNER

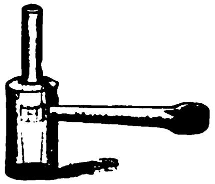
PRICE, plain, **35c.** Nickel-plated, 40c. A most handy, well made tool.


NOONAN'S
IMP'D VALVE PLIER
AND SPANNER

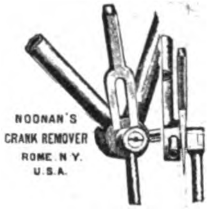
Plain, **25c.** Nickel-plated, 30c. The only tool of its kind on the market.



PRICE, 75c. A set of three pieces that are worth their weight in gold to any bicycle dealer. No more marring of chains and hard work in replacing links.

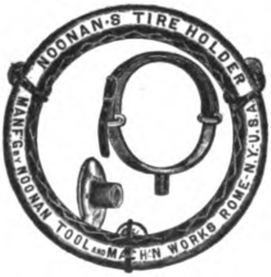

NOONAN'S CRANK SWAGE.

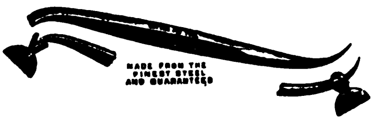
PRICE, $1.50. One of the most useful tools ever offered. Thousands used, and not one word of complaint.


NOONAN'S
CRANK REMOVER
ROME. N.Y.
U.S.A.

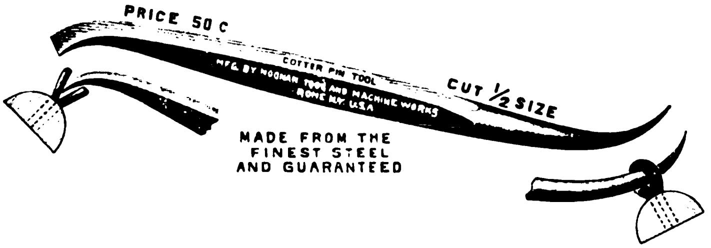
PRICE, $1.25. Indispensable in any bicycle factory, store or repair shop. Have proved a great success.

TIRE HOLDERS
$3.50 per set.
Extensions furnished
extra.


NOONAN'S TIRE HOLDER
MANF'G BY NOONAN TOOL AND MACH'N WORKS ROME, N.Y. U.S.A.


MADE FROM THE
FINEST STEEL
AND GUARANTEED

50c. EACH


PRICE 50 C
COTTER PIN TOOL
MFG. BY NOONAN TOOL AND MACHINE WORKS
ROME N.Y. USA
CUT 1/2 SIZE
MADE FROM THE
FINEST STEEL
AND GUARANTEED

JUST WHAT YOU HAVE BEEN SO LONG LOOKING FOR

And a Tool that you cannot be without. It needs no description. It is endorsed by hundreds of mechanics and is a valuable addition to the Noonan Family of Tools. 50c. each.

Send for catalog showing complete line. Sold by all jobbers. We make nothing but the highest grade.

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Stevens & Co., Selling Agents. ROME, N. Y., U. S. A.

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OUTDOORS is an illustrated monthly magazine of sta
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It is a practical and beautiful magazine for all who love the
in the open, the country home, recreation, and every worthy
door interest, **OUTDOORS** is an inspiration and a deligh
everybody.

OUTDOORS COMPANY

150 Fifth Avenue New York

CROWN

Agents Wanted **1906 Line**

24 H. P. 5 Passenger Touring Car.
12 H. P. 2 Passenger Runabout.
14 H. P. 1500 lb., Carrying Capacity, Delivery Car.
Write at once for particulars.

Detroit Auto Vehicle Co.
65-71 Catherine St., Detroit, Mich.

Stoddard-Dayton

The Model D
is our 1906 Car

It is made for those automobile buyers who want something better than the general run of motor cars and yet who want to pay a fair but not an exorbitant price.

Contains every detail and every modern mechanical feature constituting an up-to-date automobile.

4 cylinder vertical motor. 4½x5 cylinders.

Sliding gear transmission of unique construction.

Clutch driven type rear axle.

Three internal expanding brakes.

Timken Roller Bearings in wheels, axle and transmission.

2100 pounds of 4" tires and many other valuable features.

A few high-class Agents wanted for unoccupied territory.

Advance Booklet ready—Catalogue later

DAYTON MOTOR CAR CO.
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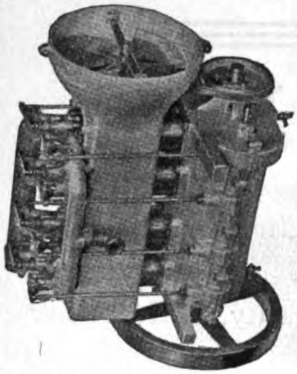
N. Y. Stoddard-Dayton Agency,
60th and Broadway.
Boston, Randliff Motor Car Co.
Indianapolis, F. L. Moore.

WE HAVE IT



Absolutely Tested
by all kinds of Herculean Work

Positively Proved
by six months of faultless performance

Cylinders surrounded by Hood with Fan connection on outer end, blowing a
CONTINUOUS HURRICANE OF COLD AIR AROUND AND OVER TOP OF CYLINDERS

Write for Descriptive Particulars

TREBERT

AIR COOLED VERTICAL MOTOR

THE DETAILS

15 H. P., developed at 1500 revolutions.
Bore and stroke, 3¾x4 inches.
Length of Motor over all, 29 inches.
Crank Shaft diameter, 1¾ inches.
Total bearing surface on Crank Shaft, 10¼ inches.
Bearing on Connecting Rods, 2x1¾ inches.
Bearing on Wrist Pin, 1¾x1¾ inches.
Connecting Rods of drop forgings with phosphor bronze Crank Shaft.

Base and Crank Case of Aluminum.
Width of Motor from end of arm to end of arm, 19¼ inches.
Center of Crank Shaft to bottom of Motor, 4¼ inches.
Center of Crank Shaft to top of Motor, 18 inches.
Total Height of Motor from bottom of Crank Case to top of Exhaust Pipe, 22 inches.
Total Weight, 225 lbs.
Lubrication by Splash Feed and constant level automatic lubricator.

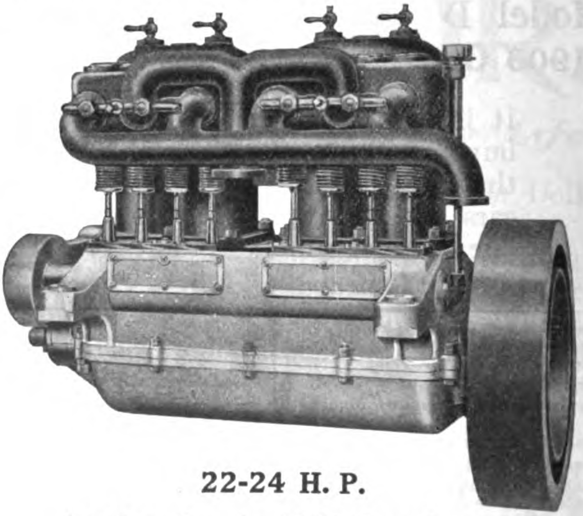
TREBERT GAS ENGINE CO

The PERFECT POW

BEAVER MOTORS—3 TYPES

12 H. P. OPPOSED
18 " "
24 " VERTICAL

All bearings and parts subject to strain are of ample dimensions.



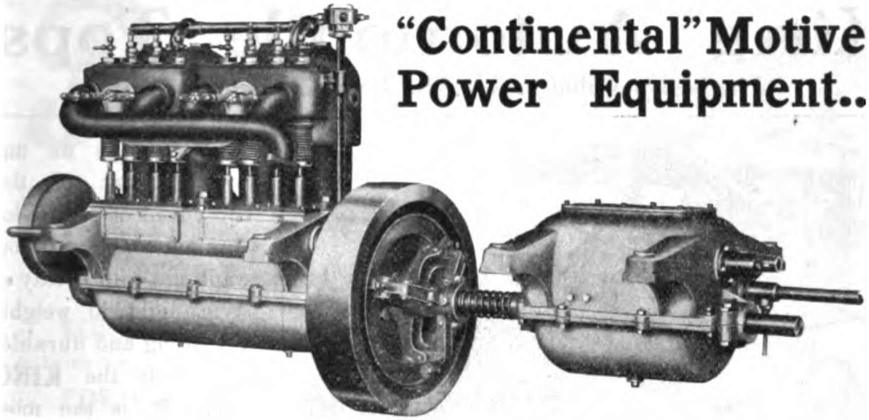
Our system perfec cation.

22-24 H. P.

Deliveries to Suit Purchaser

BEAVER MFG. CO., Milwau

"Continental" Motive Power Equipment..



"Continental" 4-cylinder Motor, Clutch and Transmission. Made in sizes 10 to 40 Horse Power.

Early Buying Insures Prompt Deliveries

Our "Continental" Motive Power Equipment is used by many leading builders and has acquired an enviable reputation in the trade for quality, durability, efficiency, etc. Inferior imitations should be avoided. Don't be deceived. Long experience together with up-to-date equipment qualifies us to build a superior machine. Our line for 1906 will be especially attractive. Advise us of your requirements and we will be pleased to quote.

Catalogue upon request.

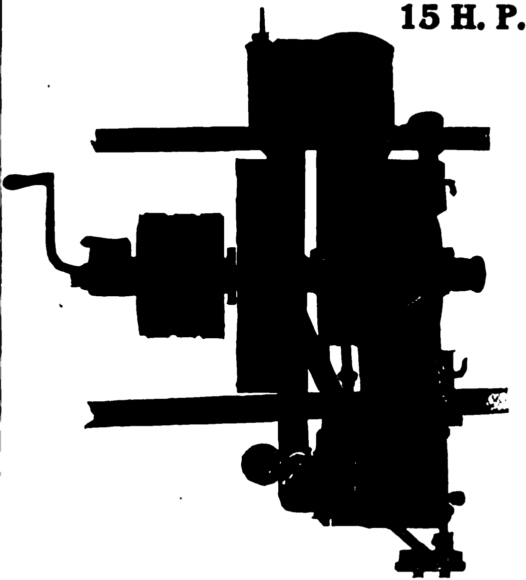
CONTINENTAL MOTOR MFG. CO.

240-44 West Lake St., Chicago, Ill.

K. P. PETERSON, Direct Factory Representative

The Westerfield Double Opposed Water Cooled Motors

15 H. P.—20 H. P.



Our motors are the best on the market. They are unequaled for power, simplicity and good wearing qualities and have superior features not found in any other make. Valves are vertical and mechanically operated; bearings are extra large and made of best phosphor bronze and finest nickel babbitt.

Our transmission has all spur gears cut from steel with oil tight case; an internal expanding clutch does away with all end thrust; it has three brake bands, two for speeds and one a brake for car. Motors for Trucks.

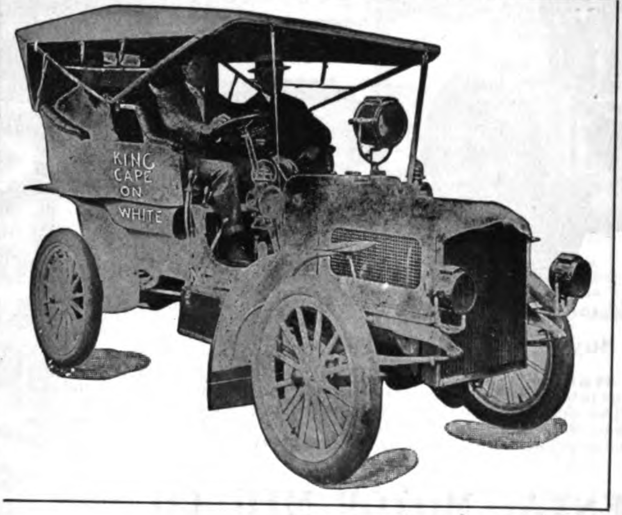
Timing Device, Gear Pumps, Mufflers.

Write us before placing your order.

THE WESTERFIELD MOTOR CO., 1535 Main St., Anderson, Ind.

King Automobile To

The best possible tops at the lowest possible prices



The top is a
portant part o
equipment of the
date automobile.
want one with ple
style, light in w
yet strong and du
investigate the
line. It is the
complete on the m
Any style, any
any size, made fo
machine. Get our
logue, samples
prices and you wi
purchase elsewher

Prompt Shipments Guaranteed

King Manufacturing Co., SPRINGFI
OHIO.

Waterproof Cloths

FOR

AUTO TOPS

We are headquarters for both Foreign and Domestic Fabrics in all Gr
and Colors.

Our Colors are as near ABSOLUTELY FAST as it is possible to
cotton or wool.

Our Artificial Leathers are coated on Mackintoshed Cloths; this EXT
layer of both Cloth and Rubber renders it ABSOLUTELY WAT
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See our tested samples at

Space No. 125, at the Madison Square Auto Show

We manufacture

High Grade Rubber Cloths of Every Description

L. J. MUTTY CO.

BOSTON MASSACHUSET

Pantasote

Leather

An Ideal Material for Automobiles and Motor Boats

FOR SEATINGS—Pantasote Leather wears better than the natural hide, it contains no oils to dry out, and is impervious to weather; will not crack, peel or chip.

FOR CANOPY AND CAPE TOPS—Pantasote Top Materials give a handsome finish to the car, are more durable than the real hide, absolutely water, stain and grease-proof, and vastly superior to the various rubber and inferior imitations of leather, as Pantasote always remains soft and pliable, and is **not effected by climatic conditions.**

Send for samples of the new and complete 1906 line

THE PANTASOTE CO.

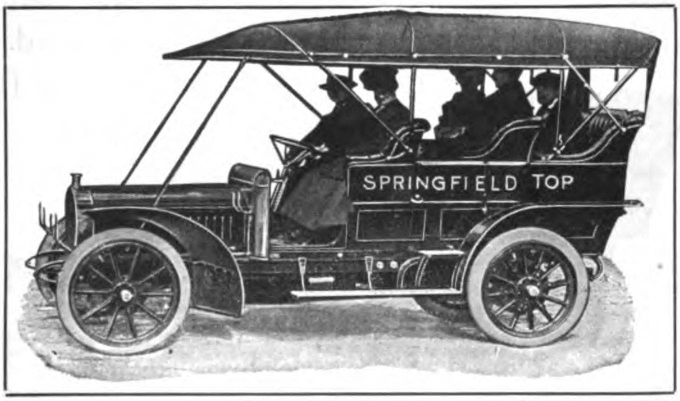
11 Broadway, NEW YORK
926 Monadnock Bldg., CHICAGO

Springfield Tops

PATENTED APRIL, 1905

All Types of Tops for all Makes of Cars

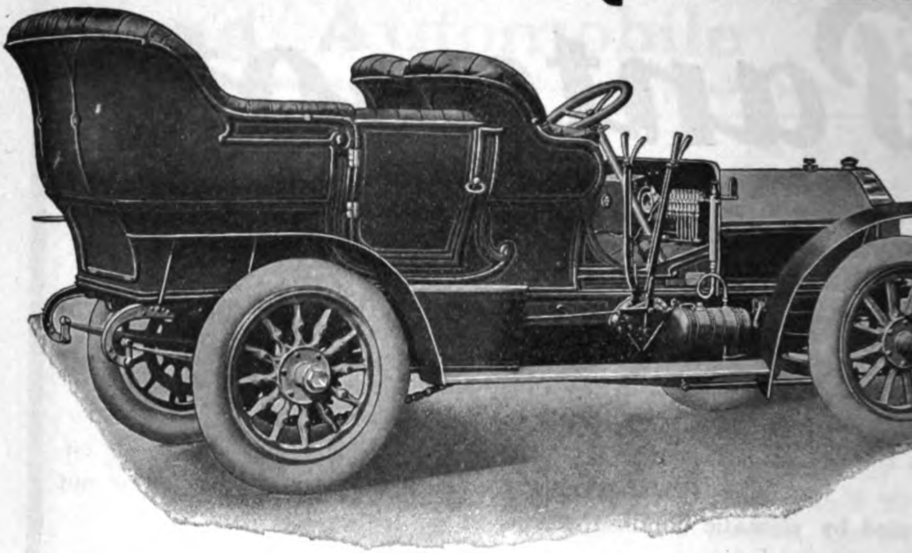
ALUMINUM BODIES



ALUMINUM FENDERS

SPRINGFIELD METAL BODY CO.,
364 BIRNIE AVENUE
Springfield, Mass.

BODIES and EQUIPMEN



ONE OF OUR RECENT PRODUCTIONS

TO MANUFACTURERS: We make a speciality of designing and finishing
chassis. Supplying body, hood, fenders, etc., We
been of service to others, we can also be to you. Our facilities have been increased ten fold. W
now take your order for your season's product and save you money and annoyance. We are m
bodies of all descriptions, Tonneaus, Limousines, Landaulets, etc., etc.

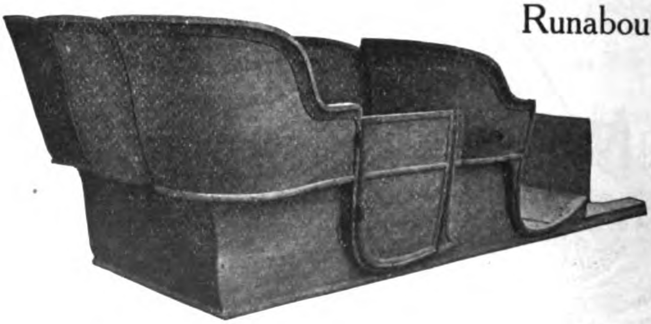
Reading Metal Body Co. **FLEETWOOD,**

The Biddle & Smart Company

Amesbury, Massachusetts

Limousine
Landaulettes

Side Entrance
and
Runabout Bodies



Delivery Wagons
and Trucks

Also
Artillery
Wheels

THE GOODRICH

QUICK DETACHABLE TIRE

The latest and greatest achievement in automobile tire building.

Send for special booklet. It will interest you.

THE B. F. GOODRICH COMPANY,
Akron, O.

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66-68 Read, St., and 1625 Broadway

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DENVER,
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3926-28 Olive Street.

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909 Arch Street
BOSTON,
161 Columbus Avenue.
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80 East Congress Street.
CLEVELAND,
416 Erie Street.
LONDON. E. C.,
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G & J

MOTOR CYCLE TIRES

THE WORLD'S STANDARD

The outer case is made with very thick rubber tread, reducing the chance of puncture to the minimum.
The inner tube is made of fine Para rubber, the finest grade of rubber obtainable.

STRONG SAFE SPEEDY

G & J TIRE Co.
INDIANAPOLIS

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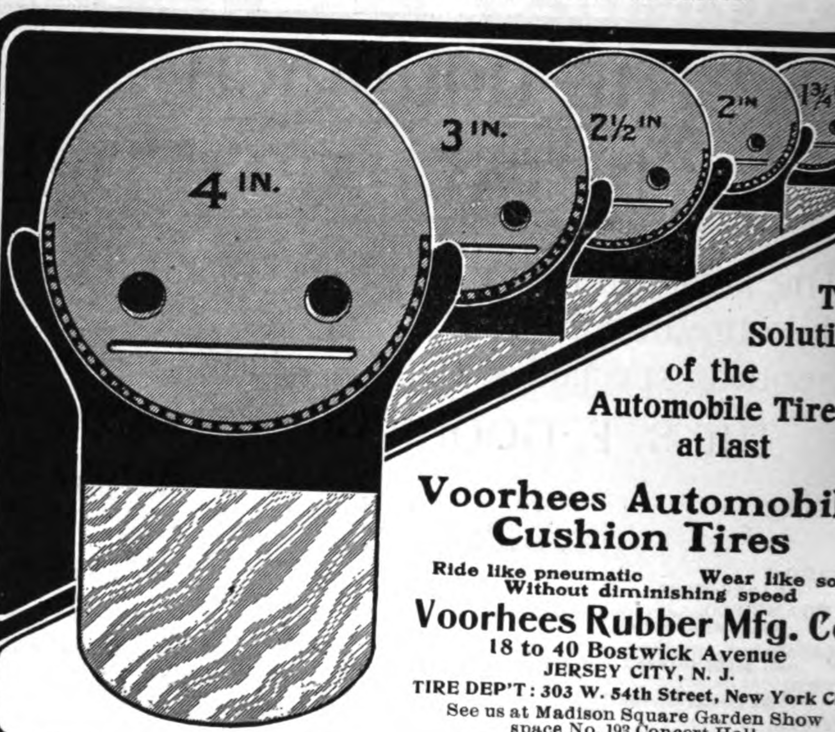

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Soluti
of the
Automobile Tire
at last

Voorhees Automobi
Cushion Tires

Ride like pneumatic Wear like so
Without diminishing speed

Voorhees Rubber Mfg. C

18 to 40 Bostwick Avenue
JERSEY CITY, N. J.
TIRE DEP'T: 303 W. 54th Street, New York C

See us at Madison Square Garden Show
space No. 193 Concert Hall

Throw Away your Pneumatics!

You will save time and money, to say nothing of trouble, if you equip your cars with the new

MOTZ CLINCHER TIR

Tire Fastener for Ordinary Work

Tire Fastener for Heavy Work

Made of the Best Rubber Stock Procurable

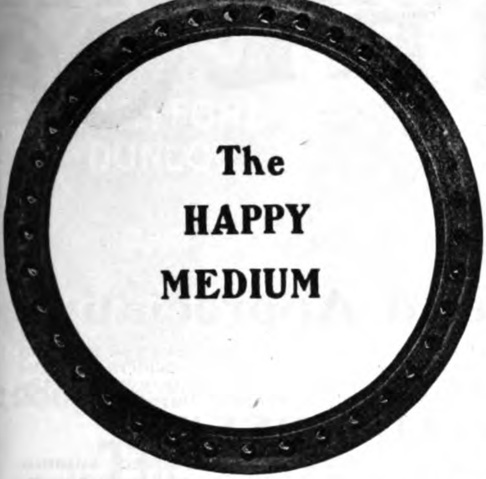
In addition to its great resiliency and wearing qualities, the fastening device is a tinct improvement over all other forms of tires, since it allows double the amount of st to retain the tire without diminishing the resiliency.

Send for printed matter and prices. MOTZ TIRES will soon pay for themselve the saving effected in repair bills.

THE MOTZ CLINCHER TIRE & RUBBER C

4 S. HOWARD STREET
AKRON, OH

The St. John Solid Rubber Cushioned Auto Tire



The Greatest Tire Man's Ingenuity Ever Produced

The Tire that solves the vexing problem now presented to both Manufacturers and private owners of automobiles, i. e.: Tire Troubles, Cannot Puncture, Perfect Resiliency Saves one-third the power now used with other tires. Fits Single or Clincher Rims and easily applied. Adopt our Tire, save annoyance and expense.

Write for our 1905 Catalogue
Testimonials, etc.

St. John Rubber Tire Co., Inc.

Automobile and Cycle Tire Mfrs.

116 BROAD ST. NEW YORK

Space J Basement Automobile Show
January 13 to 20
69th Regiment Armory, New York City

BRANCHES

Philadelphia, Pa. G. W. Nock, 126 N. 4th St.
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San Francisco, Cal. E. N. Percy, 3570 Clay St.
Lima, Ohio. H. C. Bennett, College of Electro-Therapeutics.
Orange City, Iowa, G. J. Bolks.
Victoria, Texas. J. A. Liego, North Main St.
Boston, Mass. G. W. Knowlton Rubber Co., 88 Broad Street

H. M. & S. Armored TIRES

Will Not Puncture

Does this statement interest you when we emphatically add that ALL THE RESILLIENCY IS RETAINED, notwithstanding the fact that it is PUNCTURE PROOF. Will fit standard CLINCHER rims and carry standard inner tubes. We will tell you how this ideal is successfully attained for the asking.

H. M. & S. ARMORED TIRE COMPANY
PITTSBURG, PA., U. S. A.

CONTINENTA
TIRES

Discriminating and Appreciativ

Mr. E. P. Blake, Manager of the Haymarket Automobile Station, Boston, and New Engl
Agent for the well known Jackson Cars, manufactured at Jackson, Mich., considers that
automobile equipment for those cars cannot be too good. He has consequently ordered all
cars for the New England States, for the season of 1906, to be equipped with Imported

"CONTINENTAL TIRES"

By so doing he will satisfy the growing demand of discriminating automobilists. Auto
bile dealers throughout the country who wish to do as well by their prospective purcha
would advance their interests by specifying "CONTINENTAL TIRES" on the cars for
season's delivery.

THE CONTINENTAL CAOUTCHOUC CO.

Emil Grossman, Gen. Mgr. 43 Warren St., New York. Factory; Hanover, Germ

We will exhibit at Madison Square Garden, New York, January 12-20, 1906, at space 147.
Regiment Armory, Jan. 13-20, 1906. at room "I". Coliseum, Chicago, Feb. 3-10, 1906, at sp
274-278

This AUTO TIRE is both DURABLE and LIV

When you buy an *ordinary* Auto Tire, you have to decide a difficult question.

Is it best to get a hard, inflexible tire, which will rack your bones and soon put your car out of business, but which will *last a season or more*

Or—

To get a soft, resilient, easy riding tire, which will go to pieces in a short time because it won't stand the wear and tear of the road?

Momentous question.

And either way you answer it—you lose.

Because if you decide on the *hard* tire, it means breakdowns on the road, and consequent liberal use of a farmer's team. It means constant repairs to your engine, a car always in the shop. Your aching joints are thrown in for good measure.

And if you select the *soft* tire, it means punctures, tire explosions and tire troubles generally. And you have to buy new tires every little while.

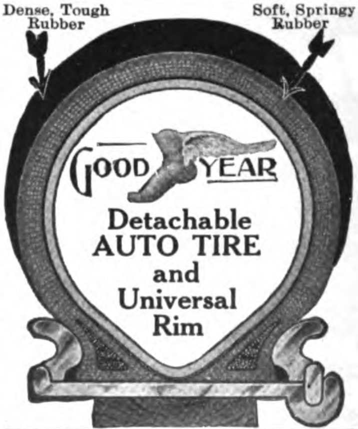
It's Money — Money — Money, either way.

You'll envy Rockefeller before you get through.

Now you can *dodge* this momenous question if you will.

Because the Goodyear Detachable Auto Tire has all the GOOD points of both the *hard* and the *soft* tire with the bad features of neither.

It's easy for anyone to understand



WHY this is true. Read carefully, and see for yourself.

First, look at the section of the Goodyear Tire in the center column.

Notice the crescent sha
tion in solid black where
of the road comes. That
firm rubber, as tough
hide, practically no wea
it. It's what the *hard*
made from.

Now right underneath
the remainder of the ou
(shown in gray) which
from pure para rubber,
lient and springy as it is
for rubber to be. It's t
as the seldom-used *soft* t

These two different
rubber—the dense, tough
sition, to take the wear,
soft, elastic rubber, to m
ride easy—are made i
solid piece by a special
You can't skin the two
rubber apart with a kn
it if you doubt.

The dense rubber and
rubber together make a ti
almost as durable as a
a tire difficult to puncture
which is as *resilient* as
could reasonably ask.

Our "Good News Bo
more about the good p
this trouble-saving tir
ought to get it now, for th
year Detachable Auto T
Universal Rim will be "
tire" next season.

THE GOODYEAR TIRE & RUBBER COMPANY, Warwick Street, AKRON,

Branches in the following cities: Boston, 6 Merrimac St.; New York, 253 W. 47th St.; Chicago, 110 Lake St.; Cincinnati, 242 E. Fifth St.
712-714 Morgan St,; Cleveland, 69 Frankfort St.: Philadelphia, 1521 Spring St.; San Francisco, Geo. P. Moore & Co., 596
Golden Gate Ave.; Buffalo, 719 Main St.; Denver, 220 Sixteenth St.; Detroit, 242 Jefferson Ave.

HARTFORD
DUNLOP

1906 ANNOUNCEMENT 1906

The 1906 Hartford Dunlop AND Hartford Clincher Tires

Will be of entirely new construction. Both types will fit our

HARTFORD UNIVERSAL RIM

upon which can be placed all makes of Standard Clincher Tires.

The Hartford Rubber Works Company
Hartford, Conn.

HARTFORD
CLINCHER

G&J TIRES

For the

Season of

1906

OPEN STEAM CURED
STRONG and TOUGH

MOST DURABLE
HIGHLY RESILIENT

The Best Tire Made
for automobile use

Write us

G&J TIRE Co.
INDIANAPOLIS

Boston Buffalo Cleveland Detroit
Chicago Denver San Francisco

IT'S THE SPARK THAT COUNTS.

The kind that will ignite your engine every time, without fail, can best be produced by

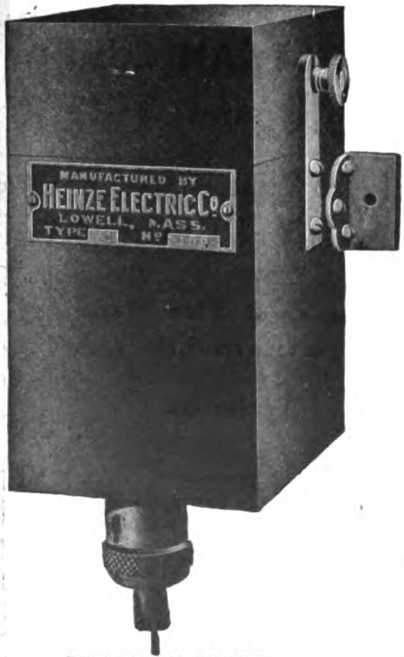
Williams' Spark Coils

IF you want a practical, e
nomical, easily-handled co
you will buy WILLIAMS'. T
1906 models will bear out t
high reputation achieved in p
vious years, and have a numb
of striking and original featur
Investigate!

E. Q. WILLIAMS

539 South Clinton St., Syracuse, N. Y.

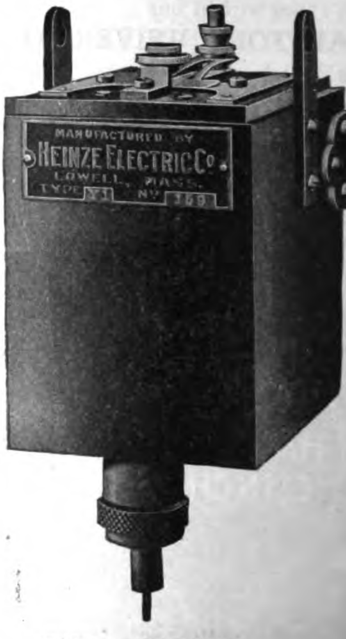
"HEINZE MOTOR CAR COI


MANUFACTURED BY
HEINZE ELECTRIC Co
LOWELL, MASS.
TYPE
No

COIL WITH COVER

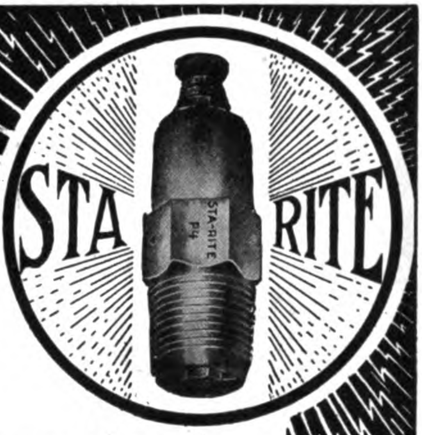
This is the most powerful coil made. Never skips. Cannot be burned out. Produces fat spark of great frequency.

Will make your engine run faster than with any other coil on the market. Try one and be convinced. Send for circulars and prices. Best discounts.


MANUFACTURED BY
HEINZE ELECTRIC Co
LOWELL, MASS.
TYPE VI
No 159

COVER REMOVED

HEINZE ELECTRIC COMPANY, Lowell, Mass.



SURETY

When you buy spark plugs, you want those you're sure of. With "**Sta-Rite**" plugs you're always sure.

Messrs. Clemens & Merz were sure of 4 of them when they were driving a National car the longest distance ever covered by a motor car in 24 hours—1094 miles. Each plug igniting approximately 850,000 charges without failure. They were our No. 4 plugs.

Separable Mica Plug. No. 24—½ in.; No. 26 metric, $1.75.

Then there were 71 gasoline automobiles advertised in the December issue of this magazine, 41 use plugs made by ONLY 35 advertisers of plugs in same issue. 9 make their own, and 21 use "**Sta-Rites**" exclusively. (Names of these Companies will be supplied upon request from any manufacturer.)

Insist upon "**Sta-Rite**" upon the shell of every plug you use—see that your new car has them and save bother. Send for new catalogue, 40 illustrations.

Madison Square Garden Show, Space No. 78
Sixty-ninth Reg. Armory Show, Space No. 61
Coliseum Show, Chicago, Space No. 178

The R. E. Hardy Co., 225 West Broadway, New York, N. Y.

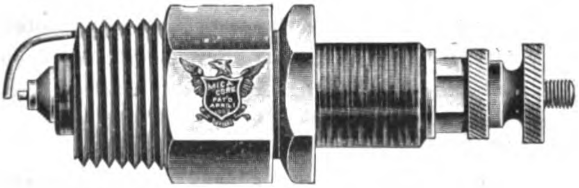
AMERICAN

1906

COILS PLUGS

TIMERS, ETC.

will remedy your ignition troubles

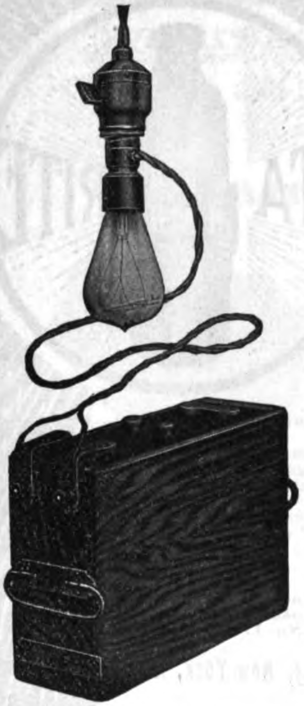


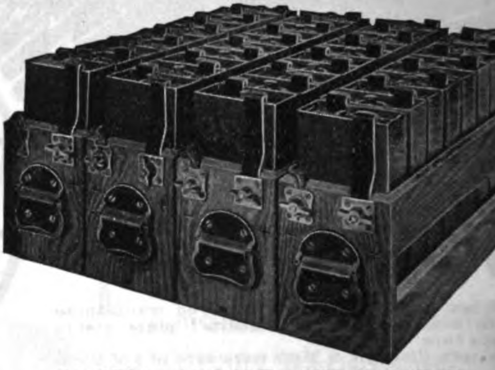
1906 American Indestructible Spark Plug

Recognized the world over for its superior qualities. It is practically Soot Proof and lasts indefinitely.

For Efficiency and Durability our 1906 line of Coils have no equal. They are fitted with an extremely fast vibrator and embody a special form of insulation which cannot be punctured under any conditions. We make all styles including the **UNIT DASH TYPE.** You should also investigate our new 1906 Timer and other ignition specialties. Write for catalog.

American Coil Co., Foxboro, Mass.





40 CELL—80 VOLT AVTO BATTERY

Simplicity of charging OUR sparkers. We giv satisfaction.

Lighting Sparking and Automobile Batteries

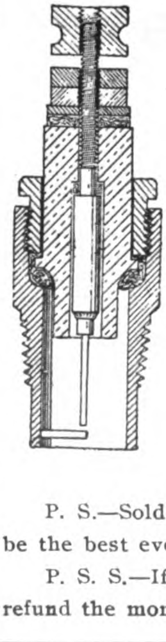
Any capacity, any voltage, any size. Our 4 and 6 volt s ers will operate an ordinary 4 cylinder car.

1200 TO 1500 MILES ON ONE CHARGE

Write for catalog.

NORTHWESTERN STORAGE BATTERY
275 E. MADISON STREET, CHICAGO, U.

The B. B. SPARK PLU



A new design absolute proof against becoming foul. sparking points extend well into the cylinder and are surrou by an open end tube which is part of the plug itself. Oil in engine cylinder is forced by the compression to creep alon side walls and top.

In the B. B. Plug the projecting tube protects the spa points and porcelain in its interior, and they keep perfectly at all times, giving perfect working efficiency. For circula wholesale prices, write

W. J. CRONIN, Agent

335 Broadway **New Y**

List, $2.00 each

P. S.—Sold extensively on the Pacific Coast for over a year and prov be the best ever.

P. S. S.—If, after 30 days use, one of these plugs proves defective we refund the money.

COLUMBIA DRY CELL

NEW YEAR RESOLUTIONS

THE BEST RESOLUTION YOU CAN MAKE IS TO USE

COLUMBIA DRY CELLS

GIVE BEST SERVICE
HAVE LONGEST LIFE

1906

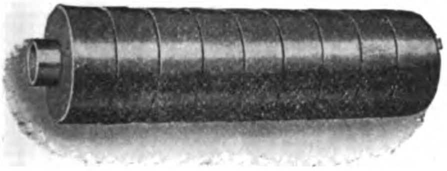
COLUMBIA DRY CELL

NATIONAL CARBON COMPANY
Cleveland, Ohio.

1906

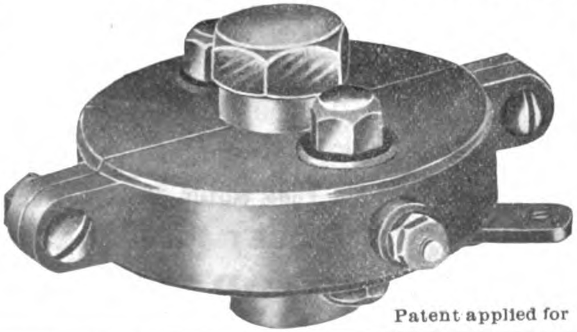
MUFFLERS——TIMERS

Automobile—Marine—Stationary



Pat. applied for

Our Muffler is absolutely noiseless without back-pressure. It is light and indestructible either from rust or internal explosions. **This Muffler is made entirely of pressed steel.** Our **Double Contact Timer** is made from one brass casting split through the center. No fibre shell, no glass, no covers, nothing to wear out. Contacts made from tool steel running in grease. Auxiliary ground contact.



Patent applied for

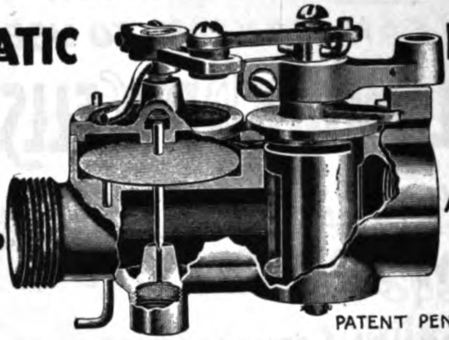
THE
POWELL MFG. CO.,
Utica, N. Y.

Garllus Carburetor

SIMPLE

AUTOMATIC

THE ONLY
CARBURETOR
HAVING A
STRAIGHT
UNOBSTRUCTED
PASSAGE



FLOATLESS

FOR
AUTOMOBILES
MOTOR BOATS
AND ALL INTERNA
COMBUSTIBLE
ENGINES

PATENT PENDING

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THE WINKLEY COMPANY.
Box 243 · Detroit, Mich.

Breeze Automatic Carburetor

1906 MODEL.

FOR ALL SIZE ENGINES FROM MOTOR CYCLE TO 200 HORSE-POWER MOTOR BOA

GET PAMPHLET C.

BREEZE MOTOR MFG. CO., Newark, N.

G & J

BICYCLE TIRES

INCREASE IN POPULARITY YEAR BY YEAR

Correct in Principle—Successful in Operation
Economical—Comfortable—Easy to Handle and Repair

G & J TIRE Co.

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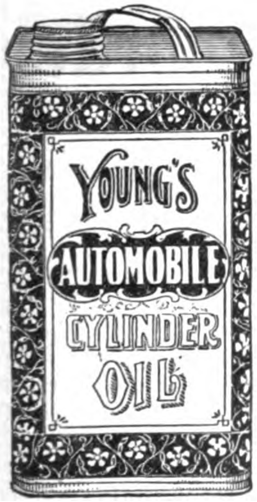

OUR NAME IS

YOUNG

But we are **OLD** in the Oil Business. Established 22 years. Our increased success of the past year proves that YOUNG'S Oils and Greases are of superior merit. Our new Metal Polish is a **Dazzler.** Sole owners of the celebrated **COX** Tire Patches, Corrugated Surface and Feather Edge; stick best and wear longest.

A full exhibit at the Garden Show. See us there or write

O. W. YOUNG,

NEWARK, NEW JERSEY.

Jones SPEEDOMETER-ODOMETER (19 Mod

not only shows the **speed** of your car and registers the Season mileage up to 10,000 miles, but has a three figure 'Trip' attachment which registers the mileage up to 100 miles. A touch of the button instantly resets the 'Trip' column to zero.

In both the Season and 'Trip' registers the miles are shown in plain **black** figures and tenths of miles in **red.**

Speed is indicated and mileage cumulatively recorded whether the car go forward or backward.

Full description of our 1906 combination Speedometer-Odometer and all other instruments in our new catalog---without question the most artistic catalog ever compiled for an automobile accessory. Sent free upon application.

AN ADJUSTABLE SHAFT CONNECTION permits of passing the Shaft through the floor; through or around either end of the dash.

THE DASH BRACKET occupies a very small space on the dash board and is adjustable to permit of the instrument being **set at any angle desired.**

MILES PER HOUR
5 10 15 20 25 30 35 40 45 50
SPEEDOMETER ODOMETER
JOS. W. JONES

Jones Speedometer **124 West 32nd St., New Yo**

Bullard's Speed-Recorde

IX
25 20 15 10 5 60 55 50 15 10 35 30

Time indicated, 22 minutes past nine o'clock

Is a clock, an Odometer, a Spe
recorder, making a permane
record on a card of every m
traveled, also a trip milage a
a season milage record.

It tells the speed you go. Wh
and how long you stop. It i
sure protection against the gue
ing of any man. Indespensal
on commercial vehicles as it kee
tab on the car every moment
is out.

It tells the doctor when he ma
a call and how long.

It cannot lie. It tells the trut
the whole truth, and nothing b
the truth.

WRITE FOR FURTHER INFORMATION TO

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AUTOMOBILE BARGAINS

WE are the LARGEST dealers of new and second hand automobiles in the United States. Complete bargain sheets sent upon request. We name below a FEW of our bargains. No matter what YOU are looking for, YOU are sure to find it at our place. If YOU are coming to New York to the Automobile Show, do not forget WE are the people.

No. 1811—GROUT steam delivery wagon, $250.00. A rare bargain.

No. 2000—Model "F" CADILLAC, almost new, $575.00.

No. 2001—Two-cylinder AUTOCAR, direct drive, engine under the hood, all late improvements, $450.00.

No. 2002—Brand new 1905 2-cylinder AUTOCAR, $950.00.

No. 2004—Two-cylinder engine under the hood, KENSINGTON tonneau, one of the most powerful machines built. A rare bargain, $500.00.

Nothing better made for its list price. List price, $1600.00.

No. 2005—1904 CADILLAC, tires like new, in the finest condition, $375.00.

No. 2006—Model "A" CADILLAC, in good running order, $300.00.

No. 2007—1904 Model "D" LOCOMOBILE in absolute perfect condition, $1550.00.

No. 2009—1905 2-cylinder POPE-HARTFORD with top, full equipment of lamps, side entrance machine, $850.00.

No. 2010—Model "B" CADILLAC, paint good, machine in fine running order, $450.00.

No. 2013—1904 OLDSMOBILE touring car, been thoroughly overhauled, in fine running order, $450.00.

No. 2014—1905 Model "O" WINTON, never been run more than 500 miles, with a folding top, Rushmore lamps, everything up to date, like new, price $1100.00.

No. 2015—1904 CLEVELAND, will seat 5, fine Cape Cart top, not run 150 miles for demonstrating purposes; cost $900.00, our price $500.00.

No. 2016—1904 POPE-TOLEDO, thoroughly overhauled at the factory, in fine condition, $1400.00—24-30 h.p.

No. 2020—1904 WINTON touring car with canopy top and glass front, guaranteed in first-class condition, $800.00.

No. 2021—1903 WINTON in perfect running order, 20 h.p., will seat 5 or 7; more for the money than any other machine; $600.00.

No. 2022—DE DION motorette will seat 4, imported machine; a bargain at $175.00.

No. 2023—KNOX runabout with fine folding leather top, no better machine for a Doctor; in absolute perfect condition; cost $1450.00, our price $500.00.

No. 2025—Four-cylinder FRANKLIN runabout guaranteed in fine condition, price $500.00. We will sell you a tonneau to fit this machine for $50.00 extra.

No. 2026—1904 WHITE steamer, been thoroughly overhauled by the maker, guaranteed in fine running order, $800.00.

No. 2027—1905 WAYNE touring car, 24 h.p., double opposed engine, in the finest condition. Tonneau never been used. Machine cost $1250.00, our price $650.00.

No. 2028—1905 AUTOCAR runabout in perfect condition, looks like new, price $600.00.

No. 2029—1905 MAXWELL runabout, newly painted, new tires, good as new, price $500.00.

No. 2030—Model "A" WINTON, 1905, with fine folding leather top, Hartford suspension, Neverout gas lamps, Presto gas tank, Cape Cart top, Pederson oil feed. Machine cannot be told from new. All new tread tires. Machine cost $4500.00. Guaranteed a mile a minute. Price $2000.00. One of the biggest bargains to-day on the market.

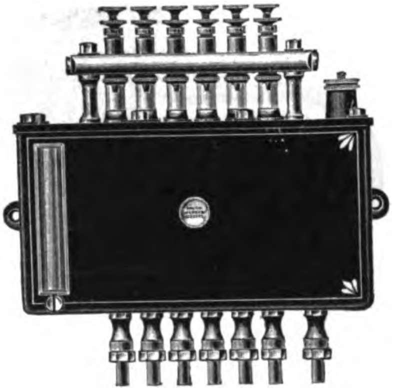
No. 2031—1905 FRANKLIN, been thoroughly overhauled, newly painted, like new. New tread tires, side entrance machine. Price $850.00.

These are only a FEW of our NUMEROUS bargains. We have over 200 others on our floors ready for demonstrating. Every machine demonstrated without any obligation to yourself. If you find anything specified above that is interesting to you, we would advise you that you telegraph us the particular number, and we will hold it awaiting the arrival of your remittance, or further communication from you. For you must take into consideration that second hand automobiles are not like other merchandise, and what we have to-day is gone to-morrow.

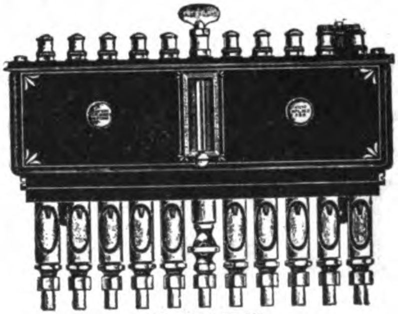
TIMES SQUARE AUTOMOBILE COMPANY
164 WEST 48th STREET NEW YORK CITY
Two doors East of Broadway

PEDERSEN LUBRICATORS

Style A
Made either Pressure or Force Feed.



Style D
Combined Pressure and Gravity Feed.



PATENT APPLIED FOR.

Style E
Force Feed Lubricator.

Patent Pending

This Oiler has no valves or spring actuated pistons. Is positive in its workings.

Manufacturer
J. T. PEDERSEN
636-644 FIRST AVE., N. Y.

"ESCO" HORNS

No. 32

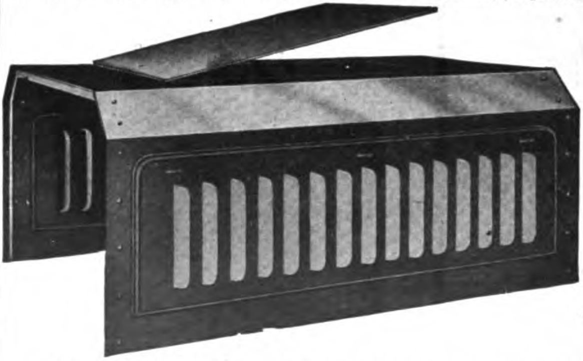
No. 30

We actually manufacture our Horns and own our factory
Send for prices and new 1906 Catalogue No. 65
Also flexible brass tubing (asbestos lined) all sizes

STEVENS & CO.
99 Chambers St., New York City, U. S.

LONG RADIATOR
AND HOOD

We recommend the Vertical Spiral Tubed Radiators which are becoming so popular ar the higher class of Automobile Manufacturers. We make these Vertical Spiral Tubed Radi out of all sizes of Tubing from ¼ inch to ¾ inch. It is now an admitted fact that Tubular I ators are the best all around Radiators for efficiency, lightness, strength and durability.



We also build a full line of Hoods in any design or shape our customers may desire. Our new Catalogue, illustrating many new styles and types and containing much valu information, is now in press. Don't fail to get a copy before deciding on your 1906 equipm

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LONG-TURNEY MFG. CO., ROME, N.

BULBS

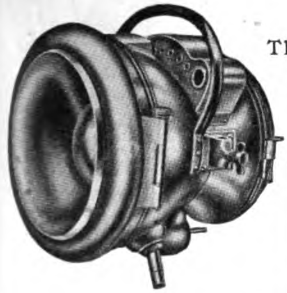
Chemically cured, soft pliable and tough for French, German or American horns.

REEDS

Non-corrosive vibratory metal composition reeds; which are not affected by weather.

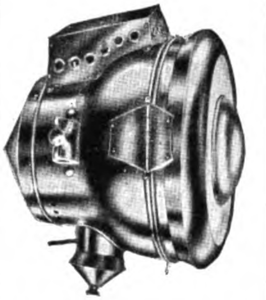
BRASS FLEXIBLE TUBING

For Horns and Speedometers



"FARO"

The most perfect Alpha type lamp; imported genuine optical lenses; opens back and front; convexed beveled front glass. A very powerful light.



"JAP"

An entirely new design, latest Parisian creation; French optical front glass throwing light half-mile.

SUPERIOR TO ANY OTHER LAMPS

Jobbers and manufacturers are invited to write for quotations

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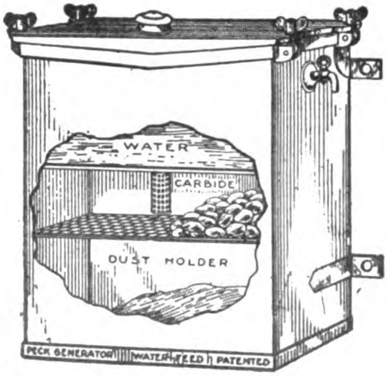
PECK PILOT LAMPS

ARE the strongest and most powerful that can be put on a car. Count the rivets you can see, then double the number:—This is one of the many reasons.

We guarantee satisfaction to the man who insists on a

PECK EQUIPMENT.



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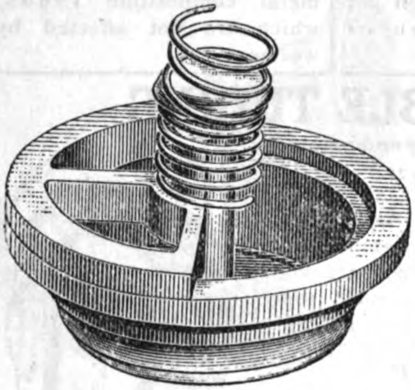
has won a National reputation. Simple—Easy to care for—Ready to use at all times. One charge will supply 2 lamps for three nights. Beware of imitations—they don't work as well as the genuine.

Prices on request.

The Scoville & Peck Co.
NEW HAVEN, CONN.

PATENT SINGLE PIECE INLET VALVE



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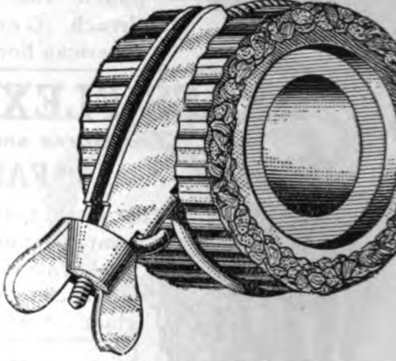
Useful Made



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All sizes for Automobile us
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B. MORGAN, 86 John St., Newport, R.

Showing Valves, Hose Couplings, Carburetors, Etc., in Room 9, Auto Show
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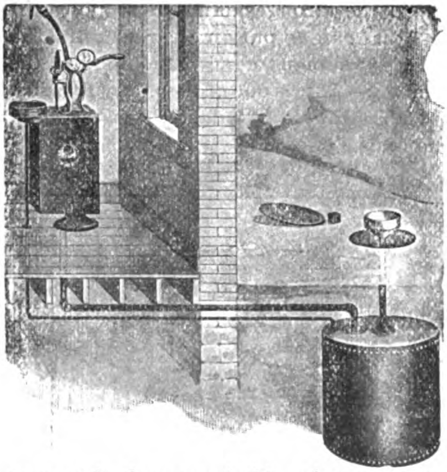
The Gordon Gasoline Storage System



One of the most convenient and s
factory methods of storing gas
known to the automobile trade.

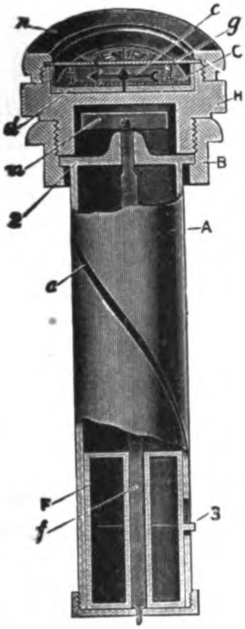
The illustration shows our reg
long-draw, double-acting pump, inc
ing all of our latest improvement
Computer, Register and Check V
Nozzle. The exposed parts of the p
are all nickeled.

The Tank shows our under-
ground storage of gasoline. It is b
of heavy, galvanized steel, riveted
soldered. Two sizes, 60 and 120
lons, are carried in stock. Other s
built to order.

Our Pumps and Tanks are suit
for either oil or gasoline. They mea
accurately from one-half a pint up to any amount, and the Computer shows
exact money value of the oil pumped. It is a most desirable outfit for auto
bile garages. Write for catalog and prices.

THE BOYER-RADFORD & GORDON TANK & PUMP CO.
New Market Street Dayton

"TRIUMPH" Gasoline TANK GAGE



This gage is applicable to tanks with or without pressure to show quantity of gasoline. Simple in construction. Reliable in operation. Superior in workmanship. Nothing to get out of order.

The "TRIUMPH" Gasolene Tank Gage is a part of the regular equipment of all

"Pierce Great Arrow" Cars

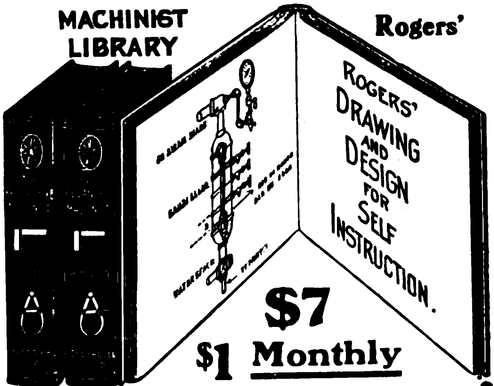
for season of 1906.

See that your new car is equipped with a TRIUMPH GAGE.

BOSTON AUTO GAGE COMPANY

FACTORY: 8 Waltham St., Boston, Mass.

OFFICE: 613 Old South Building.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$7
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The books composing the library are intended to be educational and progressing from the simple to the more complex subjects; plain books for those already engaged, or soon to be, in the practical application of the theory of mechanics; each volume is complete in itself, while progressive in the series. The books are each supplied with a ready reference index, which enables the quick use of their contents.

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We are in position to take on a considerable amount of gear cutting, either spur, bevel or internal, for prompt delivery. Accurate work guaranteed. Have best of facilities.

New Process Noiseless Pinions

Will stop the racket ma by the gears driving yo cam shafts, pumps, fans magnetos. And they wi outwear all other noisele gears. Let us hear fro you.

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WE make the kind you want. There is no need for you to go to the expense of experimenting or manufacturing. **PLANETARY AND SLIDING GEAR TRANSMISSIONS** are our specialty. This is our business. We understand it, and you can buy them from us cheaper than you can make them, and save the unnecesrary expense of experimenting and manufacturing.

PLANETARY GEARS for any size cars, up to two-ton trucks. **SLIDING GEAR TRANSMISSION** for any size up to ten-ton trucks. Single chain, shaft, or double chain drive.

Correspondence solicited.

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VALVE STEMS
NICKEL AND CARBON STEELS

We have dies for a great many varieties and sizes and can fill orders for almost any kind from stock
DIES

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DROP-FORGINGS
CRESCENT FORGINGS CO.
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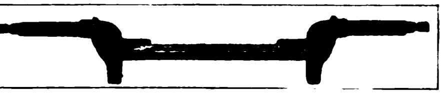
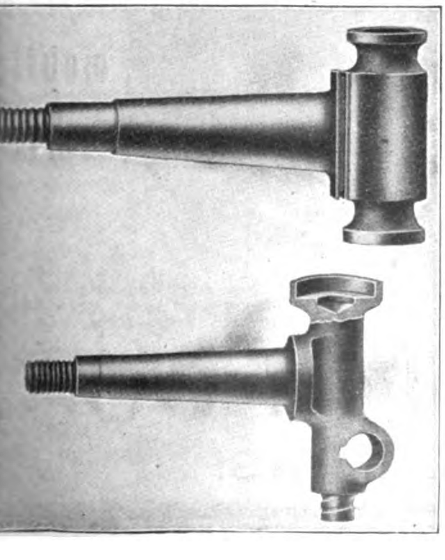
H. H. MINER, WESTERN REP., 11-13 SO. JEFFERSON ST., CHICAGO

GILL FORGED CRANK SHAFTS





The P. H. Gill & Sons Forge and Machine Works, Loraine and Otsego Sts., Brooklyn, N. Y., are manufacturing crank shafts, connecting rods, axles and steering knuckles for the automobile and marine trade. They have specially adapted machines for finishing their crank shafts and guarantee them true round. They make crank shafts and connecting rods in all sizes up to 6 ins. in diameter, anvil forged, and use the best acid open-hearth steel or nickel steel in all their crank shafts. They make axles grooved, octagon, or square and steering knuckles in all shapes.

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Flash Boilers--any size

Single Acting Steam Engines for Superheated Steam.

Water Regulators, Thermostats,
Burners—both Kerosene and Gasoline,
Running Gears, Transmissions.
Everything for building an up-to-date Steam Car.

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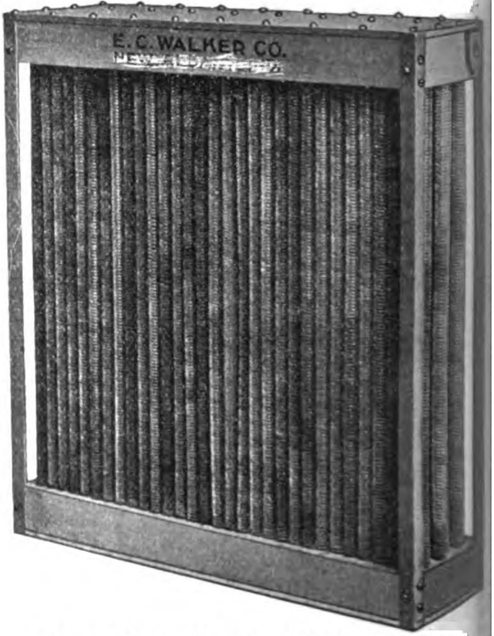

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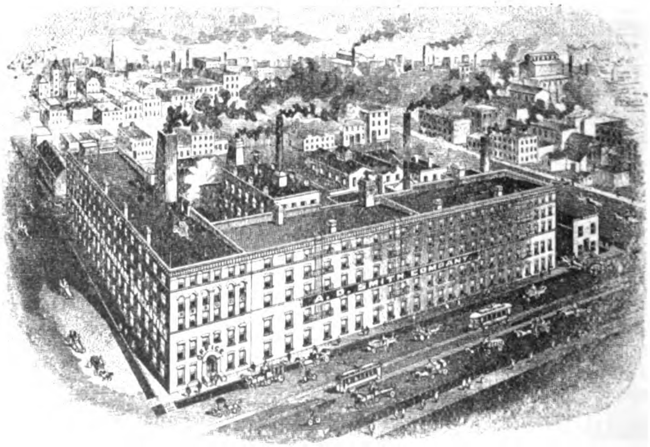

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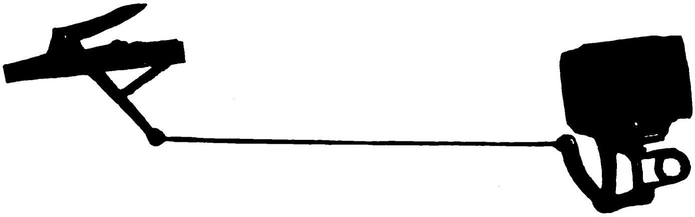
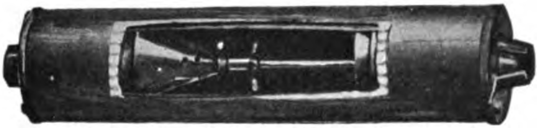
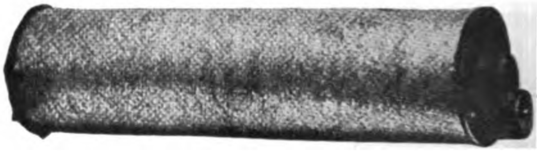
THE EJECTOR MUFFLER for AUTOMOBILE MARINE STATIONARY ENGINES

80 Sizes and Styles.

We guarantee it to muffle any engine with less back pressure than any other muffler




1906 Automobile Type


1906 Marine Type

The *Ejector Muffler* has been adopted by a large number of the leading automobile, boat and engine builders, there being over 10,000 in use. Write for particulars and prices.

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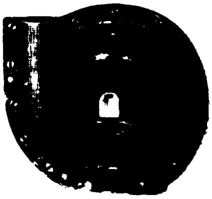
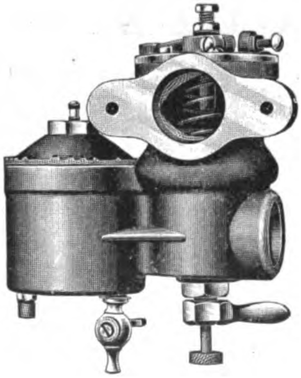
THE MOTOR & MANUFACTURING WORKS CO. 107-113 Albany St., ITHACA, N. Y.

The 1906 Loomis Carburetor


CIRCULATING PUM

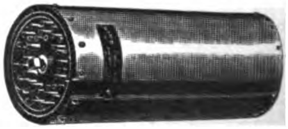


In the 1906 LOOMIS CARBURETOR we feel that we have reached the highest point of perfection in the development of automatic carburetors. LOOMIS CARBURETORS have always been noted for their simplicity, durability and efficiency, but the New Loomis has many superior points, which place it far in advance of others, among which are—***Absolutely automatic in operation, less consumption of fuel, even mixture at all speeds, perfect throttle, increase of power.***

Send for price-list.

The Loomis Muffler

BEST of them all



The fact that there are more LOOMIS MUFFLERS in use than those of any other manufacturer, is proof that it accomplishes its work in the most thorough manner. If you are interested in lessening the noise of your automobile or motor boat, write us.

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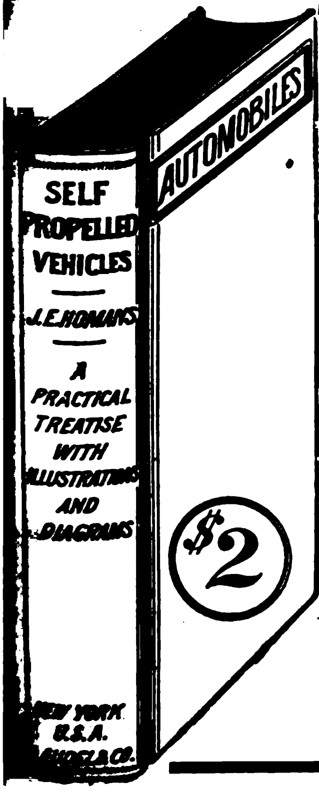

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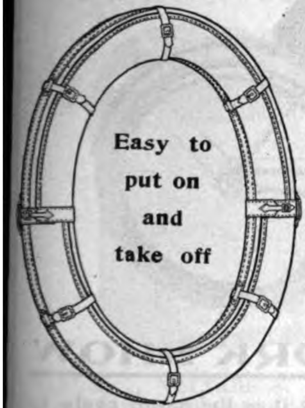
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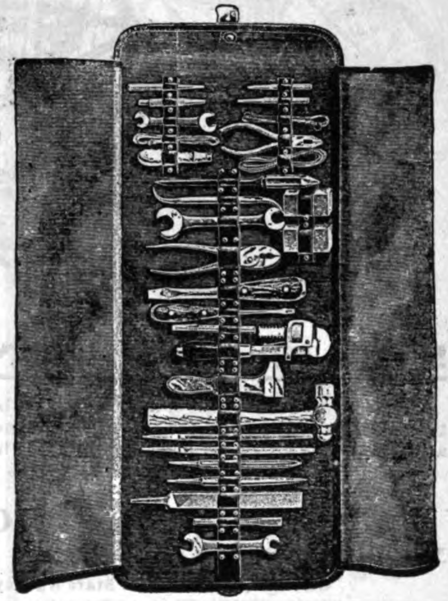

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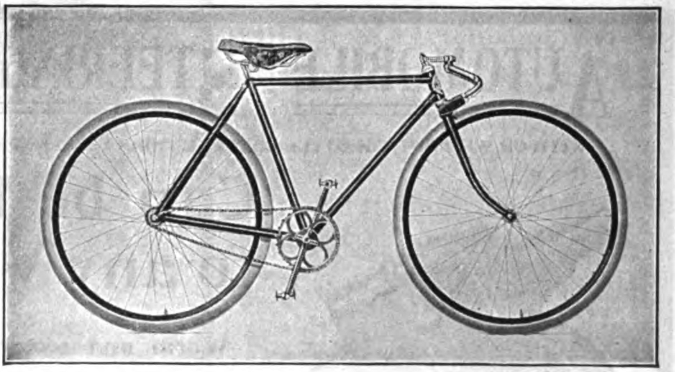
Our 1906 Proposition is Now Ready



YALE and SNELL Bicycles for the coming season represent the best there is to be had for the money, quality, construction and reliability considered. They are money-makers for dealers, and satisfaction givers for bicyclists. The 1906 Model of the **YALE** represents the highest point ever attained in the construction of a bicycle. The grace of line, beauty of finish and delicacy of treatment throughout, combined with easy-running qualities, are characteristics which place this wheel in a class by itself.

Our line of **SNELL** bicycles for the coming year is an interesting proposition for any dealer. They represent a great value. Write us for catalog and terms.

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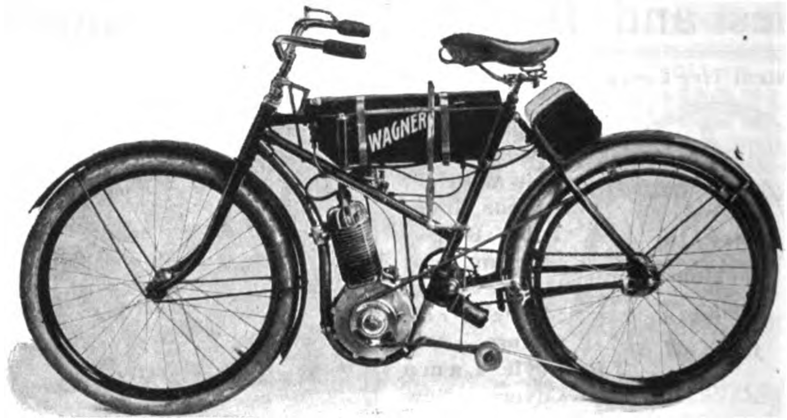

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VOLTAGE, 6.
CAPACITY 20 AMPERE-HOURS.
DIMENSIONS—8" x 8½" x 7¾" HIGH.

The size adapted for the larger cars is the Monitor Type B. 6:
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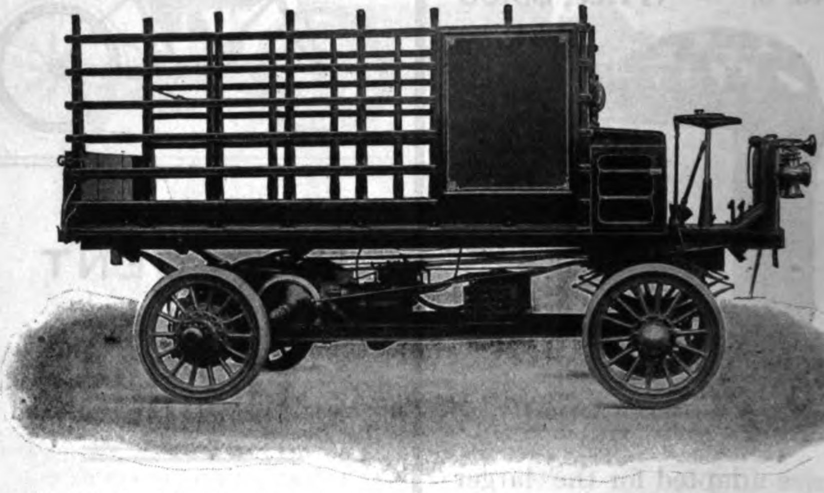
Type "A," 4000 Lbs. Capacity Type "B." 6000 Lbs. Cap



1906 models with many improvements and new features now ready for delivery.
New model "C" heavy delivery wagon, 3000 lbs. capacity, equipped with 25-H. P. tw
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Send for circulars.

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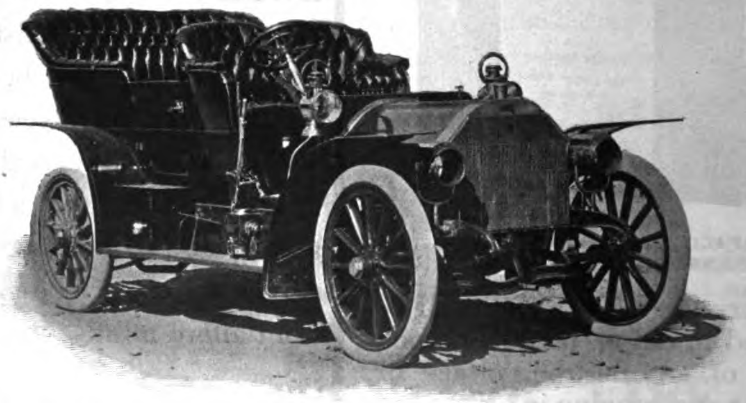

The mechanical construction of the 1906 American Mercedes is as perfect in its w
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All vital parts are imported.

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Four-Cylinder, Twenty-Horsepower

TOURING CAR - PRICE, $2500

Ask your auto agent for "The Twentieth Century Hustler" or SEND TO US FOR IT.

If you really want to know what car is having the least tire trouble, ask the tire makers. They will all tell you that in all their experience they have never seen or heard of any car that had so few punctures and that wore so little on tires as the

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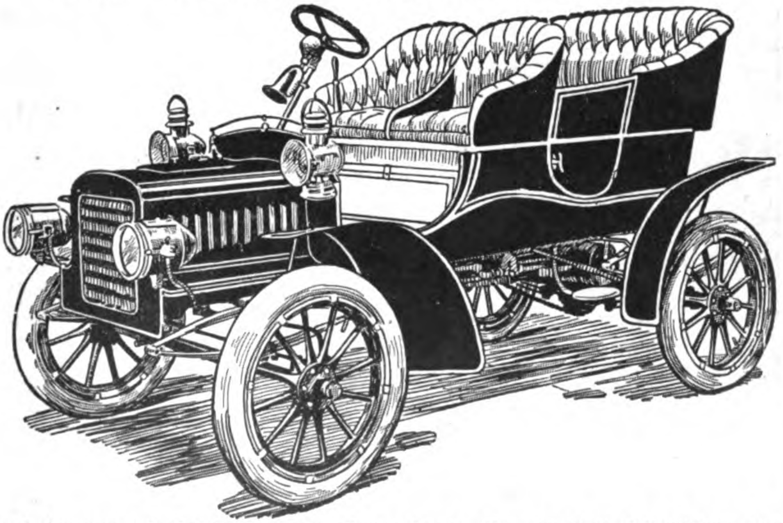
THE HONEST BUILT CAR

The LEADER



MOTOR, 2-cylinder opposed, 16-18 H. P.; Drive, Center Chain, Wheels, 30x3½; Wheel Base, 84"; Transmission, Ball Planetary Body, Detachable side entrance Tonneau; Equipment, 5 lamps, horn, generator, tools. Weight, 1500 lbs. **Price, $1000.00.**
RUNABOUT, double opposed, 12 H. P. motor, 3x28" Wheels. **Price, $800.00.**
Write us for complete details and agency proposition.

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1906 Announcement

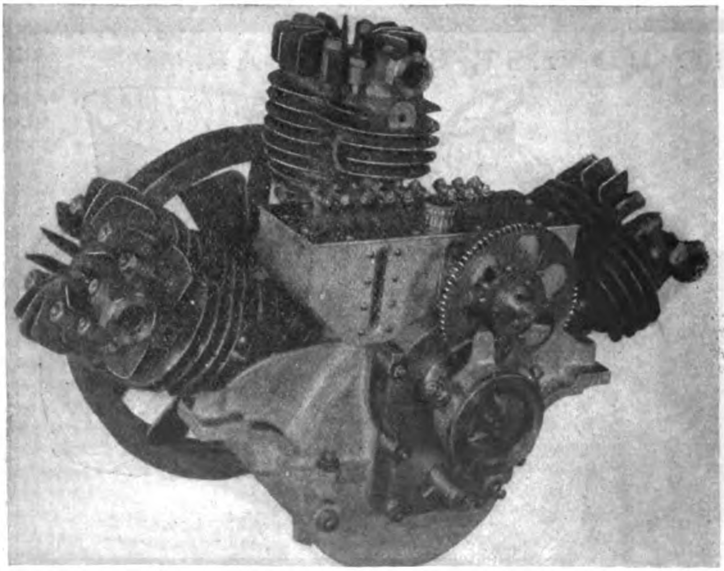
The Jones-Corbin Car

(The Automobile for discriminating buyers)

45 H. P. Touring Car,	$4500.00	45 H. P. Car with Victoria top	$4750
45 H. P. Car with Cape top,	$4650.00	45 H. P. Car with Limousine body,	$5000

Seating Capacity—Five. **Wheel Base**—112 inches. **Weight**—2700 lbs.
Engine—Four cylinder, vertical, water cooled, mechanical valves.
Cylinders—5x6.
Transmission—Four speeds forward and one reverse. Direct drive on high. Power transmitted to rear wheel by the double chain method. External and internal brakes on rear wheel drum. **Hess-Bright Ball Bearings** throughout engine, transmission, wheels, etc.
Mechanical Pump Oiler. Two **Systems of Ignition**—Magneto and battery. **Tires**—Continental, 34x5 in. rear, 34x4 in. front.
Equipment includes full set of tools, lamps and Gabriel Horn.
For further particulars send for booklet.

Jones-Corbin Motor Co., 430 Walnut St., Philadelphia, Pa.



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25–30 H. P., 6 Cyl. Air-Cooled Motor for pleasure cars. Advantages: Smoothness of running, with constant torque.

Reduces weight of car from 3 to 500 lbs. Simpler than an ordinary 4 cyl. water-cooled motor, and less liable to derangement.

Efficient cooling.

Perfect automatic force feed lubrication to each cylinder and bearing.

Saving in space. This Motor takes up less room fore and aft than an ordinary 4 cyl. water-cooled Motor of equal power.

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3 CYL. AIR-COOLED MOTORS FOR TRUCKS AND COMMERCIAL CARS. DEMONSTRATION AT OUR FA[illegible]

To our friends in particular
And the whole trade generally

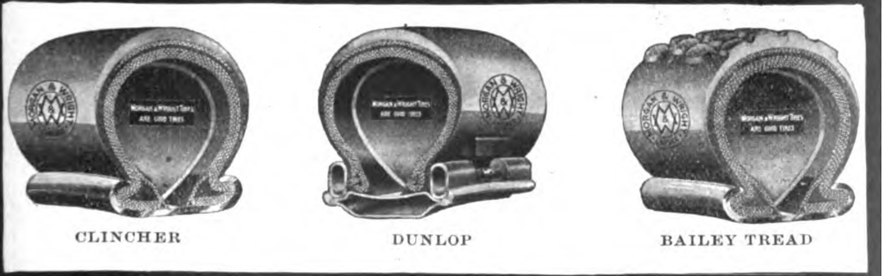
We wish you all a Bright, Happy and prosperous New Year.

May it prove one of progress and of satisfactory results to all.

THE FISK RUBBER COMPANY
Chicopee, Falls, Mass.
(*Makers of Fisk Mechanically Fastened Auto Tires.*)

THE "ELECT" FOR 1906

TIRES THAT MAKE GOOD



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have EARNED—and will occupy—a BIG PLACE in the 1906 tire business.

They have COMMANDED popular favor THROUGH SHEAR FORCE OF MERIT.

They give TREMENDOUS BACKING to our modest claim that Morgan & Wright tires are good tires.

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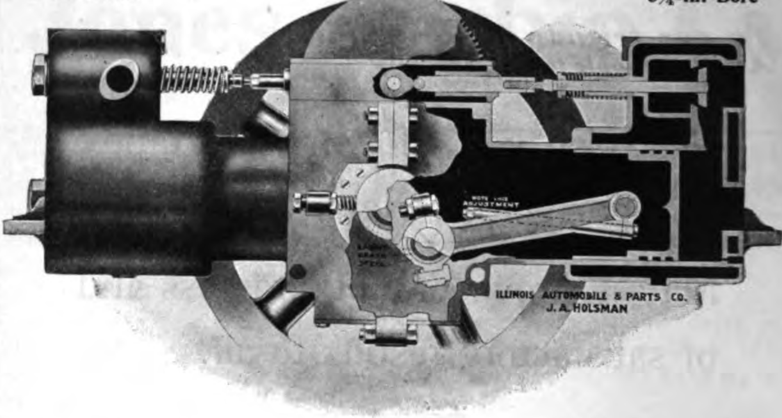
THE HOLTZ ENGINE

2 Cylinder 16-18 H. P.

5-in. Stroke **5¼-in. Bore**



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The crankcase, cylinder and head are cast integral, of fine grey iron. Pistons have
rings, one on forward end. Connecting rods are of drop-forged steel, both ends adjus
Bearings are all adjustable, including cram shaft bearings. Note the adjustments on valv
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furnish them with supports under cylinders.

Write for further details and prices.

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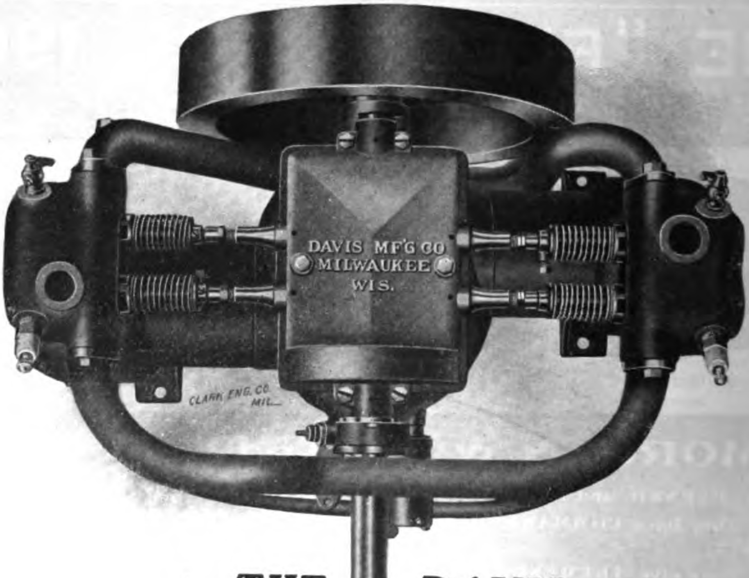
Cor. Main and Globe Sts., Peoria, Ill.



THE DAVIS

6-in. x 4½-in. two-cylinder opposed motor. Valves 2⅛-in. diameter. Guides for valves 5¼-in. long. Bearing at fly whe
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attention other than filling. We also build a two-cylinder motor of same design 4½-in. x 4-in. 15 H. P.

Write us for full description and price.

DAVIS MFG. CO., Milwaukee, Wis.

Reliable Brass Trimmings

Are made from a special mixture of metal which makes them as strong as the best Bronze, and gives them that Rich Golden Yellow—so much admired. A combination not to be had in any other way.

4835

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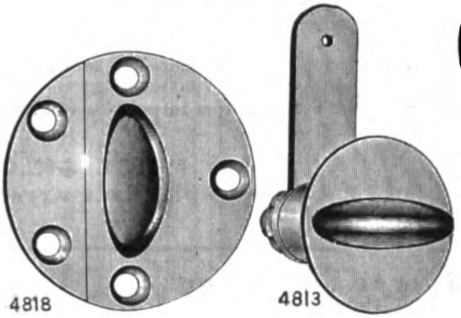
WRITE TO-DAY

Advising what you want—and let us quote you

Quantity makes a difference in the price



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Two of the most popular Heel Board Catches made

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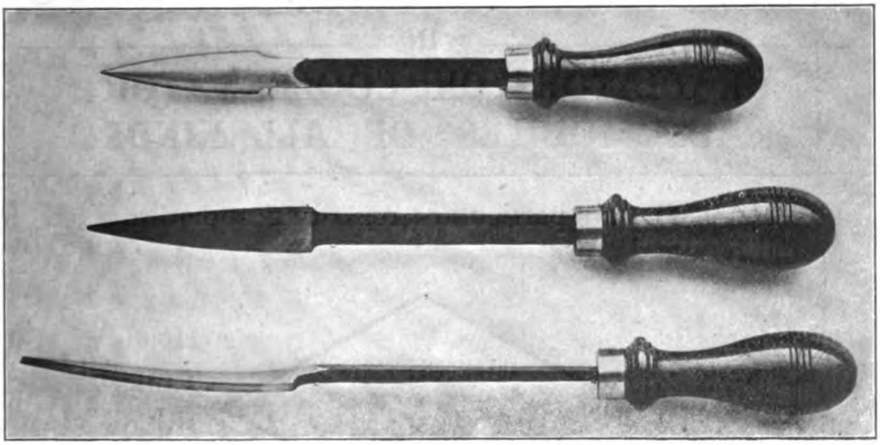
Popular Seat or Body Handle

JOS. N. SMITH & CO.

Fourth and Porter Streets **DETROIT, MICH.**

"DOWN WITH HIGH SPOTS"



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Forged from finest grade of imported steel properly hardened, and hollow ground. Wel mounted in rosewood handles. One set of three scrapers as shown above, packed in box an will be sent, express prepaid, on receipt of price.

SAMPLE SET, $2.50, PREPAID.

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PATENTED

Most Practical of Automobile Signals

The Autochime is one seamless tube of finely polished brass divided into compartments so constructed as to give a rich musical chime.

It is blown by the exhaust, being operated by a foot pedal, which relieves a spring and opens the valve set in the exhaust pipe.

It is small and compact in size, has no soldered parts to melt or jar loose, is easily taken apart to be cleaned if necessary, and being simple in construction, will not get out of order.

AUTOCHIME VA

PRICE $15.00
INCLUDING ALL ATTACHMENTS

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PATENTED

We claim for our muffler the most practical construction, the best of material, careful workmanship, in fact the only reliable muffler at a reasonable price.

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Wonderful Advanc

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Write us for full particulars regarding something new, thoroughly tested out.

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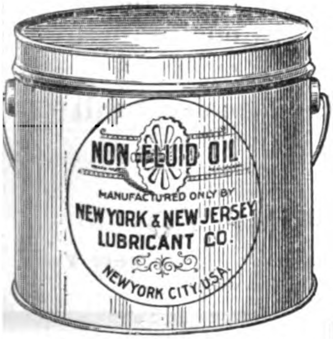
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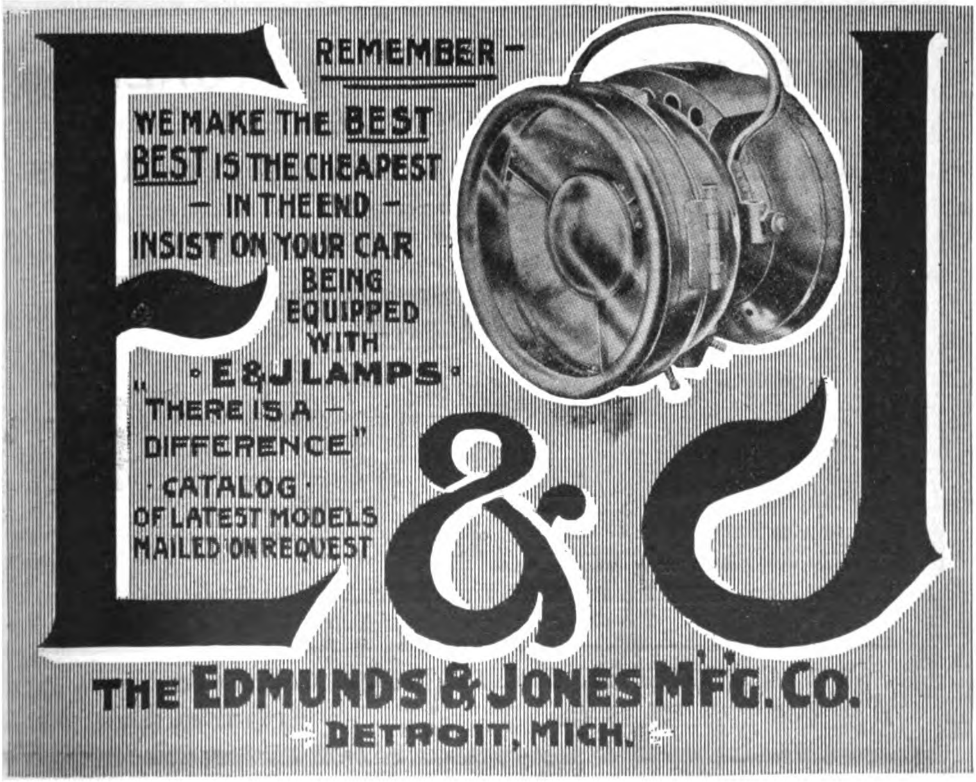
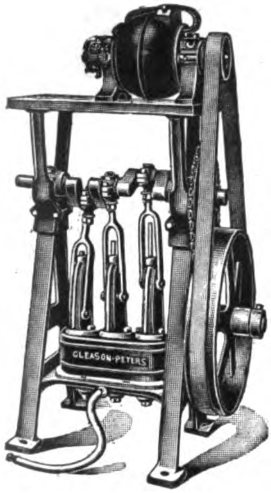
(Will exhibit at New York Shows and Chicago Show)


REMEMBER—
WE MAKE THE BEST
BEST IS THE CHEAPEST
— IN THE END —
INSIST ON YOUR CAR
BEING
EQUIPPED
WITH
E&J LAMPS
"THERE IS A — DIFFERENCE"
CATALOG
OF LATEST MODELS
MAILED ON REQUEST
E&J
THE EDMUNDS & JONES MFG. CO.
DETROIT, MICH.

MR. GARAGEMAN

INFLATE YOUR TIRES IN FIFTEEN SECONDS!



The famous **G-P** triple cylinder garage power pump and air storage tank does the trick.

Now being used in 50 per cent. of the up-to-date garages in the United States and without exception considered indispensable.

Driven by one-half horse power electric motor, high-speed gas engine, or from countershaft direct.

Write for 1906 catalogue and full descriptive matter. DO IT NOW.

GLEASON-PETERS AIR PUMP CO.

181-183-185 Mercer Street **New York**

The largest and oldest exclusive pump house in the world.

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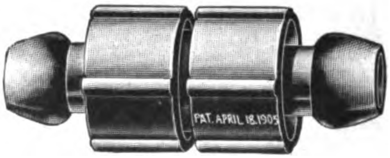
AUTOMOBILE MANUFACTURERS

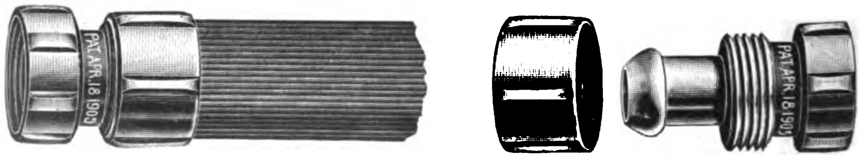
TAKE NOTICE ! ! !

Pittsburgh Hose Connectors

SHOULD BE USED



ON EVERY AUTOMOBILE



Positively will not leak or get out of order, and are readily connected to any size Hose, doing away with Washers, Clamps and Wires.
Requires no tools for connecting same.

IN ORDERING CONNECTORS IT IS ONLY NECESSARY TO STATE INSIDE AND OUTSIDE DIAMETERS OF HOSE

PRICES UPON APPLICATION

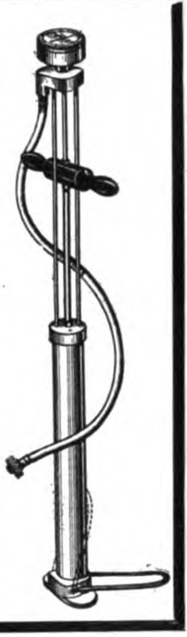
PITTSBURGH HOSE CONNECTOR CO., Sole Manufacturers

2623 Sarah St., South Side. **PITTSBURGH, PA.**

WE WILL PROSECUTE

Any PURCHASER or DEALER of a pump INFRINGING the

"ULTRA" Compound Pump !!!



The "ULTRA" is acknowledged to be.. THE BEST PUMP MADE

IMITATION only CONFIRMS this.

FITTED WITH PRESSURE GAUGE, it enables the user to inflate tires uniformly, which means *longer life to tires* and *smoother running cars.*

SPECIAL ADVANTAGES

EASIER—It delivers with *less effort* and in LESS TIME, a greater volume of air than any other pump.

QUICKER—It will fill a tire in less than a minute.

SMALLER—Total length closed, with gauge, only 20 inches.

AIR TIGHT—It has no STUFFING BOXES TO LEAK.

SPECIAL OFFER To give wider introduction to the "ULTRA" Compound Pump with GAUGE, we will send the Ultra Pump with Gauge, for the next 30 days, express prepaid, to any address upon receipt of only $6.00, regular price, $7.50.

Only $6.00—Cash with Order

GUARANTEED SATISFACTORY, or can be returned and money refunded.

Ultra Pump & Power Co. 124 Water St., Auburn, N.Y.

REFERENCE: Any Bank in Auburn, N. Y. or Fourth National Bank, New York City

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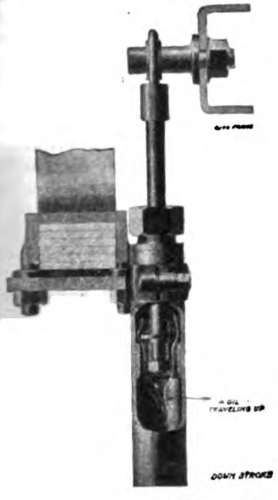
DON'T BE SHOCKED Only $30



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insure the Automobilists absolute comfort and safety—at the highest speed on the rockiest road.

Our Shock Absorber's retard all motion going Up, not going Up and Down. The Automobile has springs for the purpose of retarding the motion going down.

They are economical. simple, compact, substantial, weighing only 2½ lbs., adjustable in every direction and can be set on any machine manufactured.

Manufactured by

Gabriel Horn Mfg. Co.

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Michigan Boulevard and Thirteenth Street, CHICAGO

200 ROOMS 100 WITH PRIVATE BATH

2 Blocks from Coliseum

Reserve your rooms now. ALEX. DRYBURGH, M

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European Plan

Refined, Elegant, Quie
corner of city's two fi
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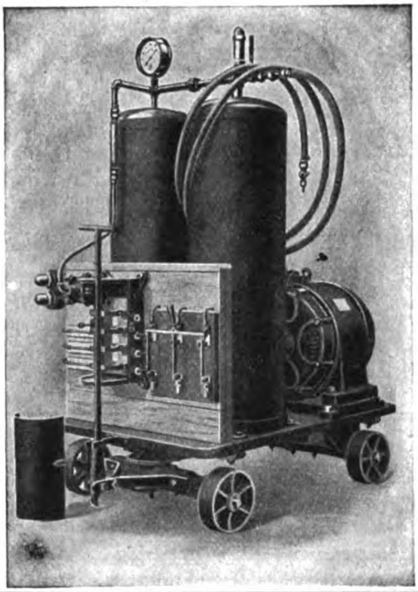
Westinghouse

Motor=Driven Blowing Outfits

Are compact, portable arrangements especially adapted for use in automobile garages to supply compressed air for inflating tires, dusting out vehicles or cleaning their mechanism, also for cleaning any generators or motors which may be in service. They are made for use on either direct or alternating current circuits.

The compressors used in these outfits will be on view at the Automobile Club of America's Exhibition, 69th Regiment Armory, New York, January 13th—20th.



The Westinghouse Air Brake Company

The Air Brake Builders

Pittsburg - - - Pa.

Are You Interested

in a proposition
that will

Cut Your Light Bills in Half?

Our 500 Candle Power Lamp costs but a half a cent an hour. If you are burning gas or electricity in your garage, we can give you twenty times as much light for half the cost. 100,000 are already in use.

There has been an entire change of management in this company, and we are now in position to deliver more promptly than ever, and guarantee the highest grade of workmanship and material.

Write us to-day for our 1906 catalog.

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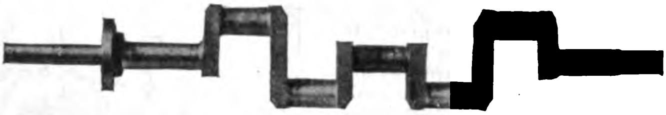
CARPENTER



Crankshafts and Axles forged only in Slab Form, slotted and finished to size
oil treated in our Projectile Department. Shafts and Axles thus made
of our No. 1 AUTO NICKEL-CHROME STEEL average:

TENSILE STRENGTH	130,000 lbs.	ELONGATION	19 pe
ELASTIC LIMIT	114,000 lbs.	REDUCTION OF AREA	60 pe

SPECIAL ALLOYED STEELS FOR

GEARS, SPRINGS, VALVES, FORGINGS, Etc.

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Here's Proof

of the excellence of **ALUMINOID**, which is an alumi
alloy. The tensile strength of the metal is 25,000 pounds
square inch, and the elastic limit is as high; that is, the mat
is perfectly elastic up to the breaking point. The specific gra
of the alloy is 3.14 or .435 of that of cast iron, and .355 of
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We guarantee all castings, and we can cast any piece
matter how complicated, if the patterns are correctly made.

The material holds threads like cast iron, and machi
with a clean clip like machinery steel.

For automobile construction it is undoubtedly the m
suitable and satisfactory metal known. Better write and f
out more about it.

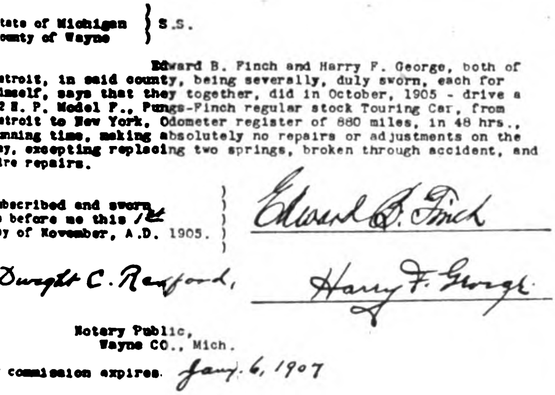
Address the sole selling agents,

BREESE & LAWRANCE

5 West Sixteenth Street New York

etroit to New York IN **48 Hours Without an Adjustment**
of any kind except two Springs broken by accident

This 22 H. P. odel F, $1850, ungs-Finch Car, as driven from etroit to New ork in 48 hours nning time, ithout a single djustment or EPAIR, except rings.



tate of Michigan } S.S.
ounty of Wayne }

Edward B. Finch and Harry F. George, both of etroit, in said county, being severally, duly sworn, each for imself, says that they together, did in October, 1905 - drive a 2 H. P. Model F., Pungs-Finch regular stock Touring Car, from etroit to New York, Odometer register of 880 miles, in 48 hrs., nning time, making absolutely no repairs or adjustments on the y, excepting replacing two springs, broken through accident, and re repairs.

bscribed and sworn
before me this 1st
y of November, A.D. 1905.

Edward B. Finch

Harry F. George

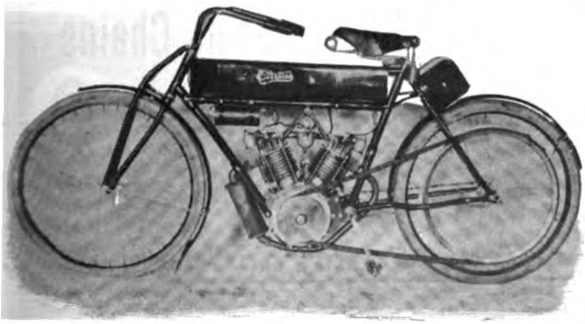
Dwight C. Rexford,

Notary Public,
Wayne CO., Mich.

commission expires. Jany. 6, 1907

Our 1906 LINE IS ..RIGHT..

Pungs-Finch Auto Co.
DETROIT, MICHIGAN



The Curtiss Silent Running Motorcycle

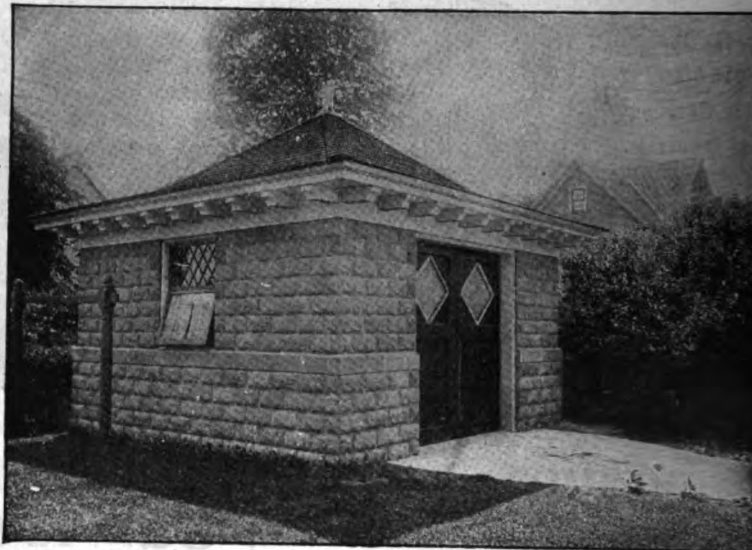
2½ H. P. Single Cylinder, **$200.00**

5 H. P. Double Cylinder, **$275.00**

For 1906 all good features retained, others added. Positive, noiseless and durable transmission. Long wheel base. 150 miles fuel capacity. Roller bearings. Write for agency proposition.

G. H. CURTISS MFG. CO., Hammondsport, N. Y.

This Fireproof Auto-Hou
Cost Less Than Wooc



It is made of Cement Stone blocks moulded on the Hercules Cement Stone Machin
blocks form the best known building material—absolutely fire proof—they last forever
like natural stone.

It is dangerous to keep gasoline in a structure not fire proof. Cement Stone has
most severe fire tests and proved itself to be fire proof in every way.

The cost of Cement Stone is so much less than the other building materials that you
the cost of the machine on the price of materials and then have a superior structure.
Stone lasts longer than brick or stone and costs less.

THE HERCULES CEMENT STONE MACHINE makes Cement Stone
a process so simple that ordinary labor can be used for that purpose.

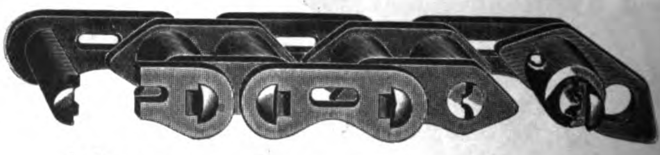
By purchasing a machine you can make your own stone and erect your buildi
cost than with wood.

Thousands of dwellings, large manufacturing plants, churches and tall buildings
being built in all parts of the country of this superior material—There is a reason for t

Catalogue No. 2 tells all
about it and is sent free.

CENTURY CEMENT MACHINE CO., No. 381 W. Main St., Rochest

The Morse Frictionless Rocker Joint Chain



Always Give Satisfaction

The only chain having a **Frictionless Rocker Joi**

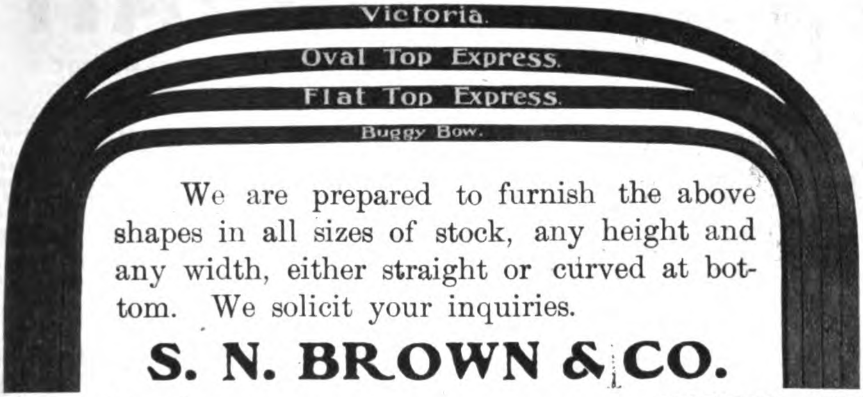
Morse Chain Co. **Trumansburg, N**

IN QUANTITIES ONLY

WE MANUFACTURE FRONT AND REAR AUTOMOBILE AXLES COMPLETE READY FOR PAINT.
MATERIAL, WORKMANSHIP AND EFFICIENCY THE BEST.
PROMPT DELIVERY AND FAIR PRICES

THE AMERICAN BALL BEARING CO.
CLEVELAND

OUR LINE SPEAKS FOR ITSELF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Oval Top Express.
Flat Top Express.
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We are prepared to furnish the above shapes in all sizes of stock, any height and any width, either straight or curved at bottom. We solicit your inquiries.

S. N. BROWN & CO.

Write us for prices. DAYTON, OHIO.

Our Pressed Steel Frames ARE STANDARD

The Parish & Bingham Co., Cleveland, Ohio

More 1906 Cars will be wired with

Packard Enameled Ignitien Cable

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PACKARD
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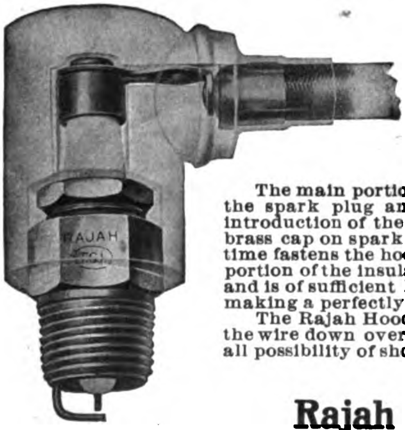
Manufacturers who desire the BEST use nothing but PACKARD CABLE

Guaranteed to give perfect satisfaction. Proof against heat, grease, oil and water.
Samples and prices?

THE PACKARD ELECTRIC CO. WARREN, OHIO



The Rajah Spark Plug Hood

"RAJAH"

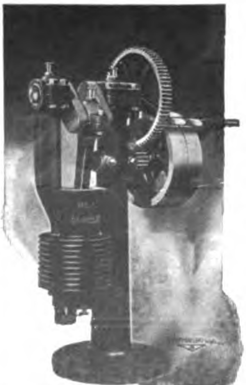
IGNITION ABSOLUTELY SURE

The main portion of the cap is of porcelain, which completely covers the spark plug and has a neck on one side recessed to permit the introduction of the Rajah Clip Terminal, which engages the slot in the brass cap on spark plug, making a perfect connection and at the same time fastens the hood in position. A piece of rubber tubing covers a portion of the insulation of secondary wire, and ferrule end of terminal and is of sufficient length to be stretched over the neck of the hood making a perfectly water-tight connection.

The Rajah Hood and rubber connection carries the insulation from the wire down over the spark plug to the cylinder head, thus obviating all possibility of short circuiting.

Rajah Auto-Supply Company
140 Washington Street, New York City

AIR COMPRESSORS



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SINGLE AND THREE CYLINDER STYLES

Just the thing for public or private garage for inflating tires, cleaning cushions, etc.

Automobile Gear and Sprocket Work
of every description
Transmissions, Automobile Machine Parts, Piston Rings, etc.

Season Contract Work Specially Solicited.
Send us your specifications.

The F. W. SPACKE MACHINE CO., Indianapolis., Ind., U. S. A.

THE "Exide" BATTERY

FOR *ELECTRIC VEHICLES* MANUFACTURED BY

THE ELECTRIC STORAGE BATTERY CO.

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The "Exide" Sparking Battery. "Exide" Depots in Principal Cities

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The Elwell-Parker Electric Company

OF AMERICA

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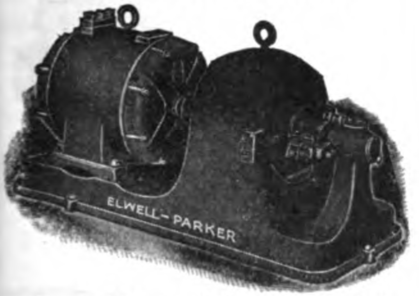

Standard Storage Battery Charging Set
Converter for Alternating to Direct Current

We are manufacturers of Electric Automobile material of specially high efficiency, electric motor and specially designed charging machines for use with direct and alternating current.

The machines that we are turning out are the high water mark of design, workmanship and materials, and hundreds of them in use are constant testimony of their particular excellence.

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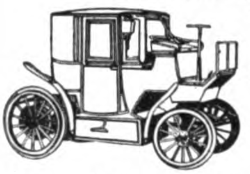
Broughams, Landaulets, Victorias, Station Wagons, Coaches, Ambulances, Etc.



Express Wagons, Delivery Wagons, Baggage Vans, Etc.

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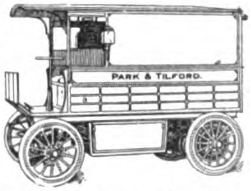
Over 100 Standard Designs. 1 to 6 Ton Capacity.



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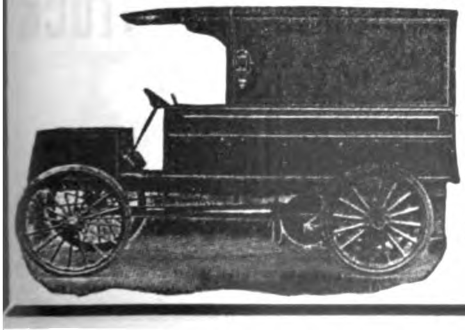
Largest Builders of Electric Vehicles in the World

SYNNESTVEDT MACHINE COMPANY



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Manufacturers of

Electric Vehicles

Delivery Wagons **Trucks**
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EASTERN BRANCH—1005 Drexel Bldg., Philadelphi
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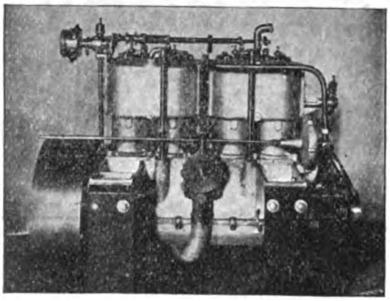

24 H.P. MOTOR

The Chadwick Cars and Motors ::

10 TO 200 HORSE-POWER

High power Gasoline Engines and Transmissions.

We make the finest Motors, Carburetors, Gasoline Filters, etc. Write us for prices and descriptions before placing your order.

We make a specialty of rebuilding Searchmont and other low Powered Cars.

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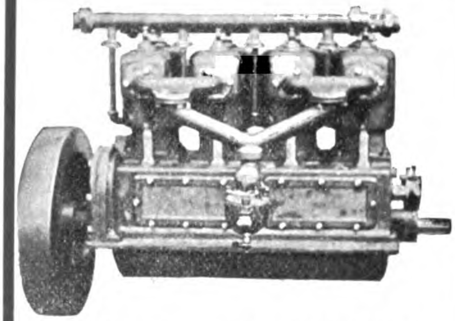
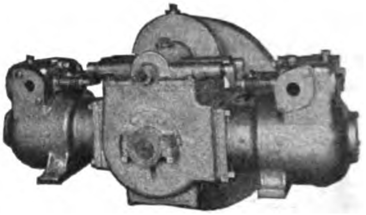


4-Cylinder, 4-Cycle, 18-20 H. P.
" " 25-30 H. P.
1-Cylinder, 4-Cycle, 1½ and 3 H. P.
4-Cylinder, " 12 and 18 H. P.
18-20 H. P. are air or water cooled.

Before placing an order for Motors write us for price and descriptive matter. Automobile manufacturers who contemplate closing contracts for motors, write us.

Smith & Williams

COLUMBUS, OHIO

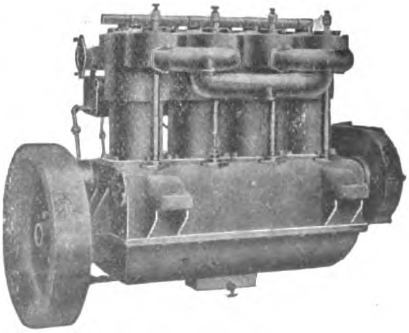


25 H. P. Vertical
16 H. P. Opposed

High Class Automobile

MOTORS

The A. Streit Machine Co. :: Cincinnati, Ohio



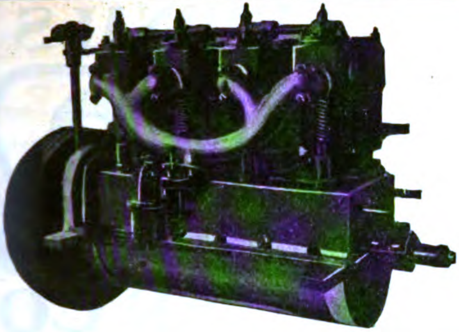
Automobile and Truck

MOTORS

16-18 H. P.
24-30 H. P.
45-55 H. P.

HERSCHELL-SPILLMAN CO.

W. Tonawanda, N. Y.



THE COLUMBUS

Motors have no superior. 4-cyl. 24-30 h. p. for automobiles. 4-cyl. 12 to 18 h. p. for motor boats. 2-cyl. opposed 16-18 h. p. 4 h. p. marine.

Steering gears and full line of spark plugs, carburetors, coils, pumps and accessories at the right price.

AGENTS WANTED

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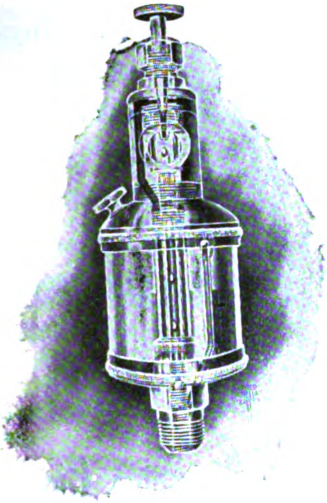
COLUMBUS SCREW AND MACHINE COMPANY
COLUMBUS, O.

The Buffalo Pressure Feed Cylinder Oiler

Fig. 50



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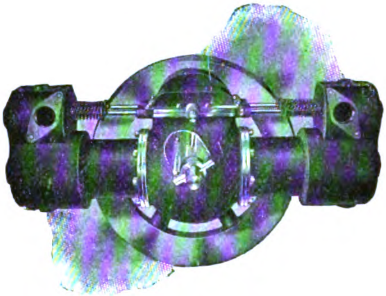
SHERWOOD MFG. CO., **BUFFALO, N. Y.**
Write for prices

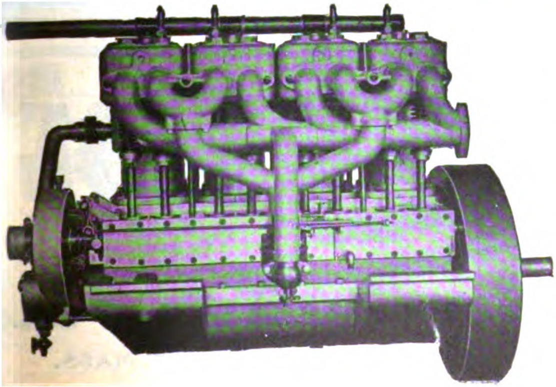
16-18 H. P. AUTO ENGINE

Adaptable to any car from a runabout to a 2500 lb. touring car.



A powerful, simple and reliable engine of the two-cylinder opposed type, developing full 16 H. P. and over. It may be described, briefly, as being of the "go-and-get-back" kind. We will be pleased to tell you more about this motor if you are interested.

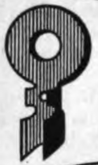
BEILFUSS MOTOR CO.
LANSING - - MICH.

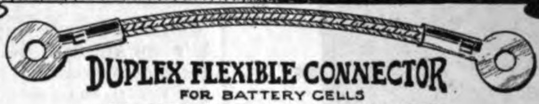


Before placing your orders for 1906, correspond with us. We can prove to you that prices, quality, and efficiency considered, our motors are the best for the purpose for which you may desire them. We build gasoline motors for racing cars, passenger busses, delivery trucks, grading locomotives, and launches from 12 to 180 H. P.

Milwaukee Auto Engine & Supply Co.
706 Winnebago Street MILWAUKEE, WIS.

DUPLEX WIRE TERMINAL





DUPLEX FLEXIBLE CONNECTOR
FOR BATTERY CELLS
PREVENTS LOOSE WIRES AND SHORT CIRCUITS
SEND 50 CENTS FOR ASSORTED PACKAGE OF TERMINALS OR CONNECTORS
· RADIATORS BUILT TO ORDER ·

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PROVIDENCE, R. I.

Spark Plug Fallacies

Any good plug will do
DANGEROUS ERROR!

Over two years ago we brought out the famous **Never-Miss** just because other good plugs did not maintain that high efficiency so essential to the exacting motorist.
Result: Sales in 1903, 17,300; 1904, 39,600; 1905, 100,000; 1906,—Well the amount we believe we will sell might seem pretty large to you. Competitors say we cut no figure in the spark plug trade. While they are knocking we get the business.

A KNOCK IS A BOOST

LAVA—MICA—PORCELAIN PLUGS

$1.50 ANY SIZE $1.50

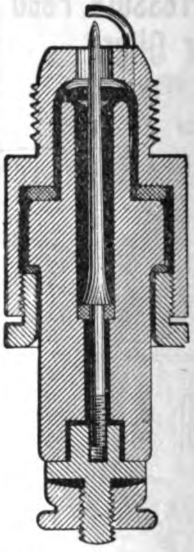
COILS, VOLTMETERS CHAIN REPAIRS, BATTERY CONNECTIONS

1906 NEVER-MISS ARE BEST 1906

Our new Catalogue now ready. Yours for the asking.

IF IT'S A NEVER-MISS IT'S RIGHT

NEVER-MISS SPARK PLUG CO.
LANSING, MICH.



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manufact
claim
spark plug
Soot-Proof.
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plug will
longer an
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plug made

Albert Champion Comp
541 TREMONT ST., BOSTON, MA
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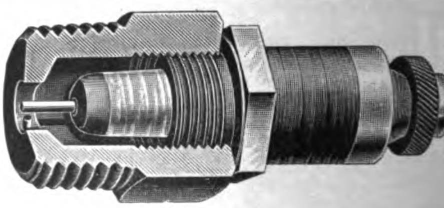
Is an indestructible **Mica Spark Plug.** The strongest made. **The Manufacturers Plug.** Best Insulation of any Spark Plug. Nothing to break. **Closed End and Open End.** Price regular sizes, **$1.50**

SOOTLESS

The Only Sootless Mica Spark Plug. New Invention. Only Sootless Plug that will not break in air cooled engines. Guaranteed six months **Sootless.** Regular sizes, **$1.75** each.



Manufactured by
THE OAKES & DOW
40 SUDBURY ST., BOSTON, MAS

The battery of dry cells you use for ignition is apt not to receive much attention until at some critical moment it fails to do its work. Then you'll wish you hadn't been content with "any old battery."

"1900 SPECIAL"
DRY
BATTERY
TRADE MARK
AN AUTOMOBILE BATTERY
THE NUNGESSER ELECTRIC BATTERY CO.
CLEVELAND, OHIO

Lock nuts prevent loose connections.

The 1900 SPECIAL cell solves satisfactorily the oft annoying ignition problem. And for this very simple reason—it is made *expressly for automobile ignition service*. It's bound to be better than ordinarily made batteries.

Send for our dry battery book.

THE NUNGESSER ELECTRIC BATTERY CO.
Cleveland
Gen'l Sales office, 128 W. Jackson Bl'vd, Chicago

The CLIMAX

Highest Voltage

Highest Amperage

THE
CLIMAX
AUTO CELL
No. 6
FOR
AUTOMOBILES
GAS AND MARINE ENGINES
TELEPHONES
AND ALL OTHER OPEN CIRCUIT WORK
SIBLEY & PITMAN
26 Warren St.
New York

Smallest Internal Resistance

Remarkable Recuperative Power

Manufactured by

SIBLEY & PITMAN

26 Warren St. **New York**

The little word cell can mean most anything, but when DUNN appears before it you know it stands for the best that science, skilled labor and money can produce.

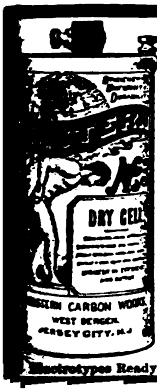
THE DUNN SEMI-DRY CELL and THE DUNN DRY CELL

Will be on exhibition at the New York Automobile Show, Madison Square Garden during week of January 13 to 20, 1906. Space No. 164, Upper tier of boxes.

COME UP AND SEE US AND GET ACQUAINTED

IT'S UP TO YOU?

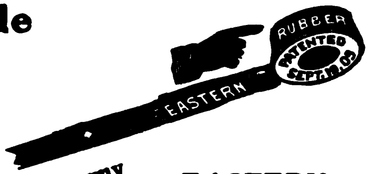
THE SEMI-DRY BATTERY CO.
73 HAMILTON ST., NEWARK, N. J.

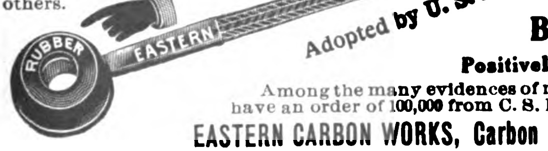

DRY CELL
EASTERN CARBON WORKS
WEST BERGEN
JERSEY CITY, N. J.

Electrotypes Ready

Eastern High Grade IGNITION CELLS

fill the place for something better than that which has been produced. More Voltage, Amperage, Life and Efficiency than all others.


RUBBER
PATENTED SEPT. 19. 05
EASTERN

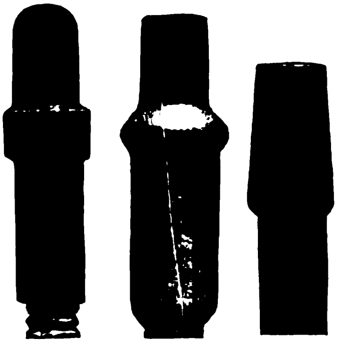

RUBBER
EASTERN

Adopted by U. S. Army

EASTERN
Battery Connector
Positively Won't Shake Loose.

Among the many evidences of merit and popularity we have an order of 100,000 from C. S. Knowles, Boston, Mass.

EASTERN CARBON WORKS, Carbon St., Jersey City, N. J.



IMPORTED

Porcelain Tubes

For SPARK PLUGS

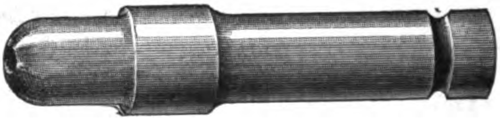
Any size or shape made after drawing or model, of a heat resisting, insulating clay composition especially compounded for this purpose.

These tubes have been used for years almost exclusively by all the leading European manufacturers, and have no equal in quality. Inquiries requested.

THEO H. GARY & CO., Manufacturer's Agents

396-398 BROADWAY, NEW YORK

Imperial Porcelain Sparking Tubes



MANUFACTURED BY

The Imperial Porcelain Works, Trenton, N. J.

All inquiries to be made through

C. S. Knowles, 7 Arch Street, Boston, Mass., Selling Agent

When desiring quotations always send sample or drawing of style required.

Porcelain for Sparking Tubes

ANY SIZE OR SHAPE

MADE OF VERY BEST MATERIAL

BY

THE STAR PORCELAIN CO., Trenton, N. J.

Send sample or drawing for prices

The LEAVITT SECONDARY DISTRIBUTOR

Leavitt Timer

Through its **unequaled simplicity** has clearly proven the superiority of this system of ignition. The past season's success has proved our claims.

Our primary timer is the fastest made, the least effected by wear. We have **absolutely solved** the question of **burned contact points.**

Our goods are fully guaranteed.

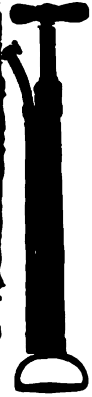
Submitted to Manufacturers on trial.

SEND FOR CATALOGUE AND PRICES.

UNCAS SPECIALTY CO., Norwich, Conn.

Leavitt Distributor

Try It Before Paying



The IMPERIAL-WIXON COMPOUND AIR PUMP

We are so sure that you will agree that it is the best automobile tire pump made that we leave the decision to you.

$5 on approval.

Makes the tire last longer.

(PATENT ALLOWED) Works quickly, easily, effectively.

If you own an automobile, you need an Imperial-Wixon.

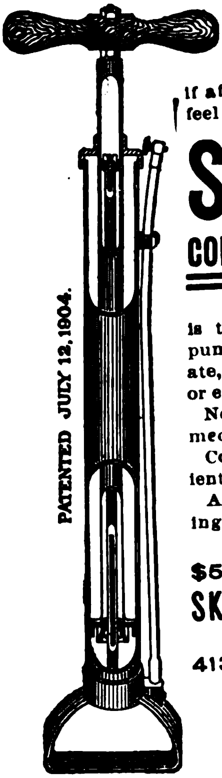
Ask any dealer or drop us a line.

IMPERIAL BRASS MFG. CO.

242 So. Jefferson St., Chicago.

MOTOR CAR EQUIPMENT CO., 55 Warren St., New York
Sole Export Agents

Your $5.00 Back


PATENTED JULY 12, 1904.

If after 30 days' trial you don't feel absolutely sure the

SKINNER COMPOUND AIR PUMP

is the best automobile tire pump, and the easiest to operate, that you have ever tried or ever seen.

No wires, gears or complex mechanism to get out of order.

Compact, light and convenient for carrying.

A Labor Saving, Time Saving, Satisfaction Giving Pump.

$5 EXPRESS PREPAID

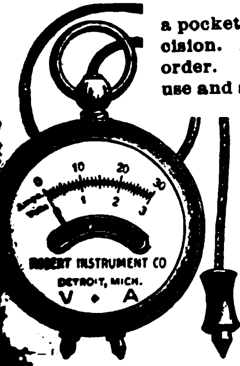
SKINNER & SKINNER
Mfrs.
4133 INDIANA AVENUE
CHICAGO

Reference: Illinois Trust & Savings Bank, Chicago.

DON'T WORRY

about your batteries. There is a certain way to test them and find out their condition at any time, in an instant. Use the

ROBERT VOLTAMMETER



a pocket instrument of precision. Does not get out of order. Always ready for use and shows

AT A GLANCE THE STATE OF YOUR BATTERIES

No failing on the road
No walking home
No towing home from weak batteries

If you have THE ROBERT and make good use of it.

RICE, including Leather Case, $6.00

(0-8 VOLTS—0-30 AMPERES)
(0-6 " —0-30 ")
(0-10 " —0-30 ")
(0-30 AMPERES)

WRITE FOR CIRCULAR AND DISCOUNTS

ROBERT INSTRUMENT CO.
54 Shelby St. DETROIT, MICH

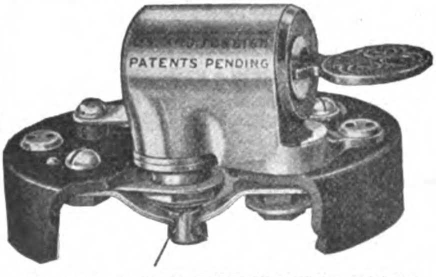
AUTOMOBILE STOLEN

This headline appears frequently in the newspapers

"The Auto-Lock-Plug"

makes theft impossible.

When you hold the key, the car remains in the garage.



Above cut shows "THE AUTO-LOCK-PLUG" mounted on a Splitdorf switch.

Takes the place of the commonplace cut-out plug. Operates by Yale Lock and Key. Three keys with each lock. Each lock requires a different key. Dust proof, grease proof and theft proof.

Simply Perfect Perfectly Simple

Lock plugs to fit any form of **Splitdorf switch** or coil ready for immediate delivery. Lock plugs for other switches and coils made to order in quantities. Price, $5.00.

AUTO-LOCK-PLUG CO.
31 NASSAU STREET NEW YORK CITY

THE

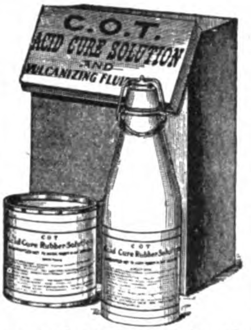
Rubber Auto Tire Protector

is a boon to automobilists. It offers them the only adequate protection from a damaged tire. It may be adjusted in five minutes, conforms perfectly to any size tire, and being made of the same extra quality of rubber and duck of which the best tires are made, it is not an unsightly device. It saves carrying a new case in your car, and no trip should be attempted without this tire protector.

For sale by all dealers or

Empire Rubber Manufacturing Company
TRENTON, N. J.

C. O. T. ACID CURE SOLUTION AND VULCANIZING FLUID



Will stick a patch on your inner tube so tight it will not slip under any friction or be loosened by heat.

You can fill up a cut in your auto shoe by using it to join a piece of rubber size of cut.

You can line or reface the auto shoe with canvas, leather or rubber, in fact make an old shoe new. Guaranteed not to loosen or slip by friction or heat. The World's best.

Rubber patches both round and oblong.

Watch the jobbers' catalogs, see what they think of it.

CHARLES O. TINGLEY & CO.
RAHWAY, N. J.

BECKLEY & RALSTON CO., Chicago, Ill., Western Distributors
PHOENIX AUTO-SUPPLY CO., St. Louis, Mo., South " "

A WISE MAN ONCE SAID:

Show me how a man walks and I'll tell you what kind of a man he is.

WE SAY:

Tell us what an Auto or Garage owner uses to repair his Inner Tubes, Outer Casings, etc. and we will tell you what kind of man he is,

EXTRAVAGANT OR ECONOMICAL?

Now Mr. Auto and Garage owner, why spend a lot of money in a steam vulcanizer, cumbersome presses, etc. or send away your tires and tubes to be repaired, when with the M. & M. Cement and Acid Cure Solution you save all this bother and get the same results as a steam vulcanizer.

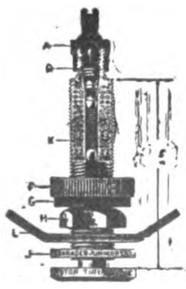
Let us send you a demonstration, with a Booklet describing this wonderful preparation and the name of your nearest dealer.

½ pt. M. & M. Cement and Acid Cure Solution, $1.00
1 " " " " " " " " 1.50
1 qt. " " " " " " " 2.75

Manufactured only by THE M. & M. MFG. CO., Akron, Ohio

The Post & Lester Co., sole New England Agts., Hartford, Conn.
Buffalo Branch, 401 Franklin St., Buffalo, N. Y.
Western Branch, 826-830 S. 18th St., St. Louis, Mo.

Schrader Universal Va



Trademark Registered April

Simple and Absoluely Airtight

Schrader Motor Tire Valves, as shown in cut, are the regu ment for G & J Motor Tires; our No. 777 Valve being the standa and 8" tires, and our No. 725 Motor Valve being the standard fo larger than 8"

Supplied to the trade by all Tire Manufacture

Manufactured by A. SCHRADER'S SON, Inc., *30-32 ROSE S NEW*

MILTON P. HIGGINS, President   JOHN W. HIGGINS, Secretary and Gen. Manager   GEORGE I. ALDEN, Treasurer

Worcester Pressed Steel Company

WORCESTER
PRESSED STEEL
COMPANY

Successors to the WORCESTER FERRULE AND MFG. CO. Established 1883

Light and Heavy Metal Stamping, old Forgings

Ball-Bearings, Stove Trimmings and Sheet Metal Specialties
Automobile, Bicycle and Electrical Fittings

CHICAGO OFFICE, 1064 MONADNOCK BLOCK

MAIN OFFICE AND FACTORY **Worcester, Massachusetts.**

Cable Address, PRESTEEL
CODES A. B. C., Lieber's

DEOXIDIZED

ALUMINUM

CASTINGS.
BETTER THAN FRENCH ALUMINUM

BRIDGEPORT DEOXIDIZED
BRONZE AND METAL Co.
BRIDGEPORT, CONN.

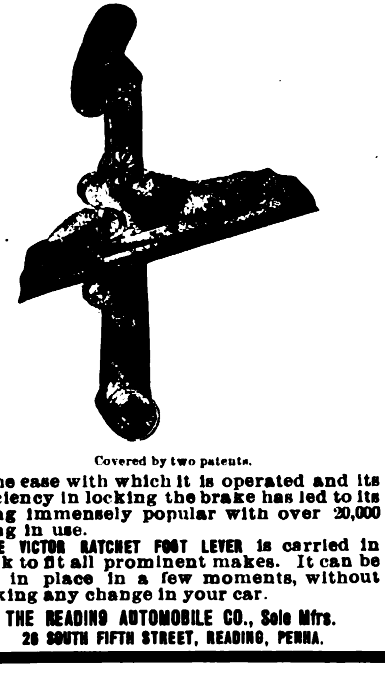
DEOXIDIZED

PHOSPHOR-BRONZE

FOR
BEARINGS
AND GEARS.
TWO GRADES.

There has been no device placed upon the market recently which has been of more service to the automobilist the than

THE VICTOR RATCHET FOOT LEVER



Covered by two patents.

The ease with which it is operated and its efficiency in locking the brake has led to its being immensely popular with over 20,000 being in use.

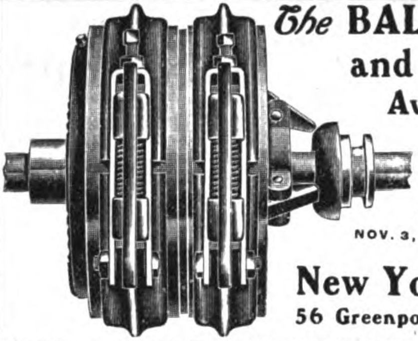
THE VICTOR RATCHET FOOT LEVER is carried in stock to fit all prominent makes. It can be put in place in a few moments, without making any change in your car.

THE READING AUTOMOBILE CO., Sole Mfrs.
26 SOUTH FIFTH STREET, READING, PENNA.

HIGH GRADE MALLEABLE "STEEL" CASTINGS

For automobiles, pneumatic tools, general light machinery, where a casting true to pattern, free from blow holes, shrinkages, and imperfections is desired. Gray iron gasoline engine cylinders, pistons, and piston rings made of imported irons, French process of molding, highest grade possible to obtain in this country.

WESTERN MALLEABLE STEEL CO.,   DETROIT, MICH.

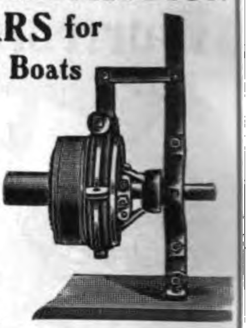


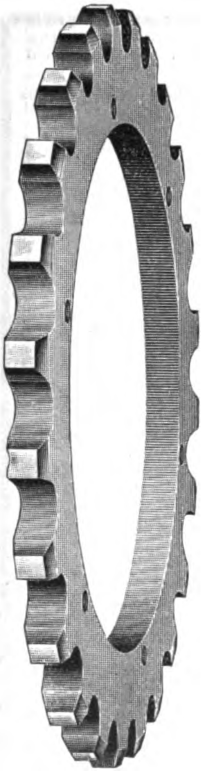
The BALL Improved TRANSMISSION and REVERSE GEARS for Automobiles and Motor Boats

MADE ONLY OF SPUR GEARS

PATENTED APRIL 9, 1901; NOV. 3, 1903; JAN. 12, 1904; FEB. 23, 1904

New York Gear Works
56 Greenpoint Ave, BROOKLYN, N. Y.
Western Agents, J. H. NEUSTADT CO., St. Louis, Mo.





Cullman Sprockets

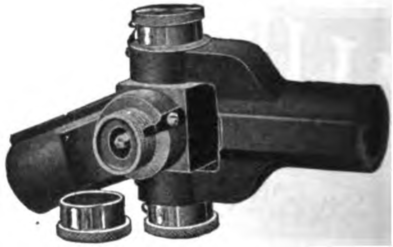
For Diamond Baldwin and Whitney Roller and Block Chains

Sprockets, Chains and Cullman Differentials carried in stock.

Send for new Catalogue

CULLMAN WHEEL CO.
1020 Dunning St.
CHICAGO

UNIVERSAL JOINTS



DESIGNED FOR AUTOMOBILES AND MOTOR BOATS.

Taken apart or put together with the hands no tools needed

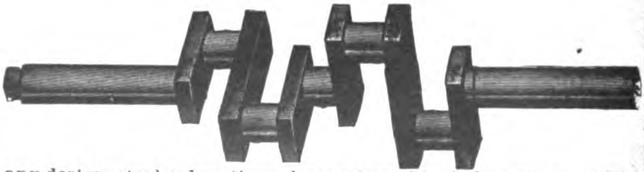
One filling of Grease Cups lasts an ordinary season.

Send for Circular showing other Good Features of the STRONGEST and MOST DURABLE Joint made

Manufacturers should have these joints on their 1906 models

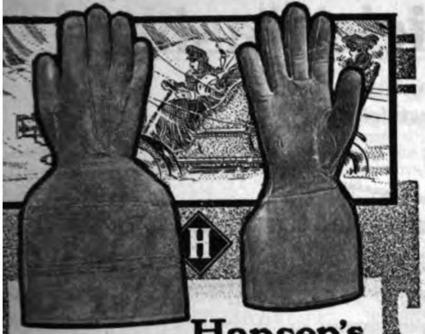
BLOOD BROS. AUTOMOBILE & MACHINE CO.
Manufacturers
KALAMAZOO MICH.

Safety is a Desirable Feature in an Automobile



For that reason, make sure that your crankshafts are perfect. What the years have taught us is at your service, and we can give you accuracy in manufacture and highest grade material. Send us blue prints, and we will give you estimates on any quantity, in any design, stroke, length or size, up to and including four inches in diameter.

STANDARD CONNECTING ROD COMPANY. Beaver Falls, Pa.



Hansen's Auto Gauntlets

Can be had with or without warm wool linings, with wide or extra wide cuffs to cover largest overcoat sleeve. Four styles in black or brown horsehide of our special tannage—always soft and flexible in spite of continued exposure to elements. Wash clean without drying hard. Perfect fit and pliability permit most delicate adjustments without removal. Sent direct if not at your dealers. Write for descriptive circular.

O. C. Hansen Mfg. Co.
360 East Water St., Milwaukee

"Built Like a Hand"

THE N. I. R. AUTOMOBILE SHIRT

Light, Tight, Large Long and Shower Proof

Our Automobile Shirt is protection perfected. It has a double fly front, with two rows of ball and socket buttons. The collar ties tight and overlaps. The sleeves have elastic bands and fit the wrists close. It reaches to the feet and is large and comfortable.

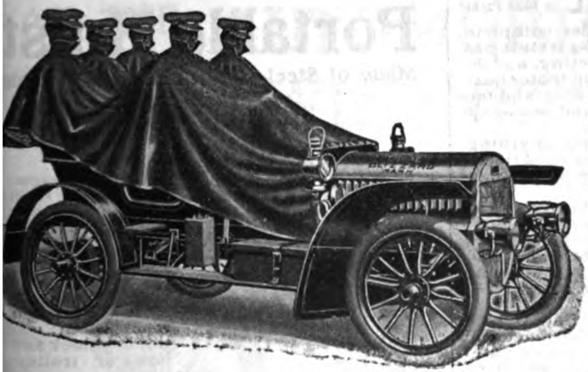
We also make an Auto Pail, Repair Tape and Rubber-treated fabrics for Automobile Topping, and all have

Our Trade Mark

N. I. R.

NATIONAL INDIA RUBBER CO., Bristol, R. I.

SELLING AGENCIES—43-5 Pearl St., Buffalo. 84 Lake St., Chicago. 409 W. Lombard St., Baltimore.



Avalon Storm Aprons

afford complete protection against storms and bad weather for both cars and occupants. Made with openings for one to five persons. Fasten closely about neck. Openings can be closed if not used. Heavy rubber cloth—plaid back.

We also handle

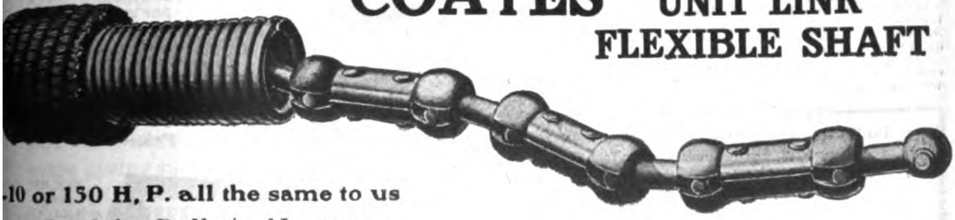
WEED CHAIN TIRE GRIPS

Prevent skidding and assist in traction on muddy roads.

Write for "Special Deal" prices on above.

The Ball-Fintze Co.
Dept. D. **NEWARK, OHIO.**

COATES UNIT LINK FLEXIBLE SHAFT



-10 or 150 H. P. all the same to us

Send for Bulletin No. 192

New at it—not much—been at it **30** years.

OATES CLIPPER MFG. CO., Worcester, Mass., U. S. A.

Overhead Vehicle Washers

PATENTED MAY 3, 1898

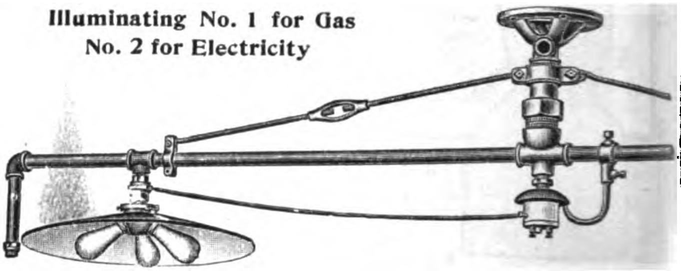
This cut is from a Photograph of our latest improved Superior No. 2, and illustrates the heavy and substantial construction of the head which is of cast brass.

This is the only ILLUMINATED WASHER on the market. Users of this machine are enthusiastic in its praise. Allows of washing at night or in a dark place, throwing the light where it is needed. Safe, simple, reliable.

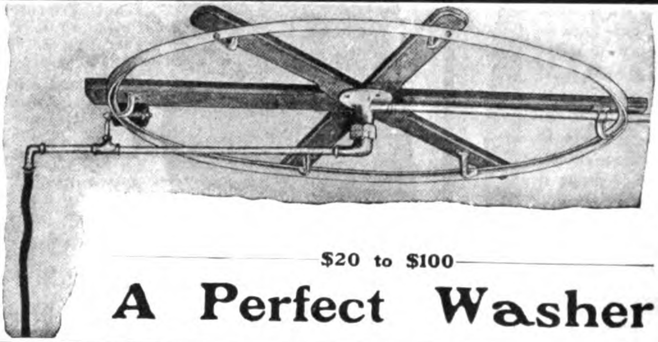
PLAIN WASHERS ALSO

Send for catalogue.

Illuminating No. 1 for Gas
No. 2 for Electricity



VEHICLE SPECIALTY CO., Inc., Hartford, Conn.



$20 to $100

A Perfect Washer

Use one and forget to worry about keeping your car clean. Scientifically constructed, durable, useful, ornamental. Lightens labor, saves water and hose. Every well-appointed garage should have one.

Catalogue on request to

PERFECT MFG. CO.
Saratoga Springs, N. Y.

AUTOMOBILE KNOWLEDGE Means Money in YOUR Pocket

We are the only school that provides complete, practical, *money-earning* and *money-saving* training by mail in operating, repairing, constructing, and designing every kind of motor vehicle and motor boat. We have special courses for *owners*, shop and factory *employees*, *chauffeurs*, *motor-boat* and *motorcycle users*, and *others*.

There are only two ways of learning anything. One is slowly and tediously to gain the experience yourself; the other (and better) way is to take advantage of the experience of others.

Though we offer you the long, hard-learned, thorough experience of experts who have done prominent work in the development of the new vehicle, we offer this experience in such form that to teach it to you will take only a few minutes and cost only a few cents each day—*the few minutes and the few cents that you ordinarily waste.*

Our instruction has been prepared and is conducted by well-known men, of long experience and proved ability both in automobile engineering and correspondence instruction. It is strongly endorsed by *prominent manufacturers, club* and *association officials, racing men, trade-paper editors*, and others whose standing in the automobile field lends authority to what they say.

In the automobile industry, the demand for competent men is so great that ability, no matter how acquired, is considered above "pull" and length of service. This makes it easy for an ambitious man to qualify quickly for good wages and prompt advancement.

For further information, send us your name on the accompanying coupon. This will cost you only a moment of time and a postage stamp, which will be well spent for interesting and convincing literature.

FILL OUT TEAR OFF MAIL TO-DAY

The Correspondence School of Automobile Engineering
Suite 1346, Flatiron Building, New York City.

Please send to my address by return mail, a free circular, giving full particulars of your correspondence courses.

Name ____________________
Street and No. ____________________
City ____________________ State ______

Or write for circular without sending coupon

Portable Hoist

Made of Steel—Light, Strong, Durable

One man alone can operate with load, moves easy.

Automobile manfrs. Garages, find this the right thing. Lifts any portion of automobile, remove engine, and such like.

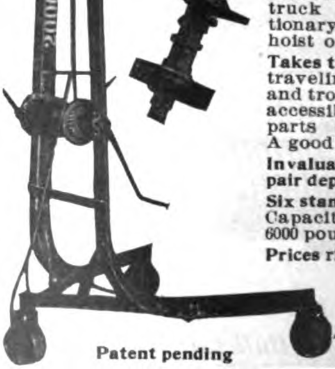
Greater convenience as hoist and truck than stationary block and hoist or trolley.

Takes the place of traveling crane and trolley, more accessible to all parts of plant. A good truck.

Invaluable in repair department.

Six standard sizes Capacities 1000 to 6000 pounds.

Prices right.



Ask for further particulars

Patent pending

WM. S. NICHOLLS
253 Broadway New York

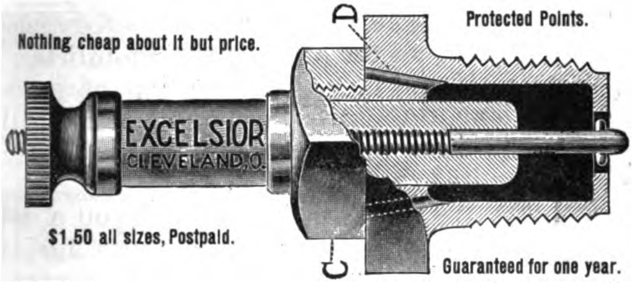
The Excelsior is the Plug for 1906

All others are now out-of-date

Costs no more than old style Spark Plugs which it out-classes in every feature.

The **EXCELSIOR** is more soot-proof than any spark plug ever made, and if fouled can be cleaned instantly without removing the plug or stopping engine or disconnecting the wiring. (See description in December Trade-Journal or write for printed matter.)

Nothing cheap about it but price.



Protected Points.

$1.50 all sizes, Postpaid.

Guaranteed for one year.

NOTE.—We do not furnish a small attached handle or wrench with the Excelsior Spark Plug as we have found it unsightly and impracticable, for if made large enough to be of use it gets in the way of pipes, valve cases, etc., or may jar the plug loose and a *small handle does not give sufficient leverage.*

The sparking points and inner surfaces of the Excelsior Spark Plug can be thoroughly cleaned in an instant (without stopping the engine or disconnecting the wiring) just a slight turn of the threaded collar or nut (C) and the ventilating holes (D) are uncovered allowing the gases on suction, compression and explosion to rush violently back and forth through the plug, effectually scouring all carbon and soot from the inner surfaces, also convenient for removing condensation of moisture which sometimes short circuits spark plugs in large engines. The collar is then turned back to its original position covering the openings and sealing the plug. A solid copper washer is inserted under the sealing collar or nut (C) and the plug is absolutely gas tight. The turning of the sealing collar does not loosen the center insulator.

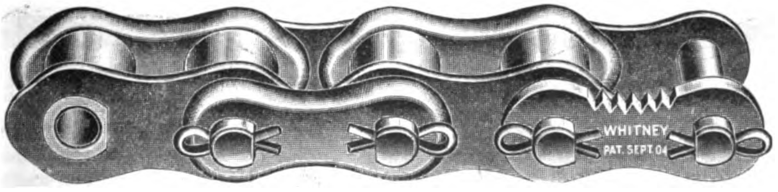
The ideal plug for the man whose time is worth anything and any one who can appreciate a real improvement in this line.

Furnished in any thread with either German silver or platinum points, single, double stone or porcelain insulation as desired.

Dept. C. **The Excelsior Spark Plug Co., Cleveland, Ohio.**

AT THE AUTOMOBILE SHOWS NOTICE "WHITNEY" CHAINS

ON MOST OF THE LEADING CARS



1906 MODEL DETACHABLE TYPE—Patented

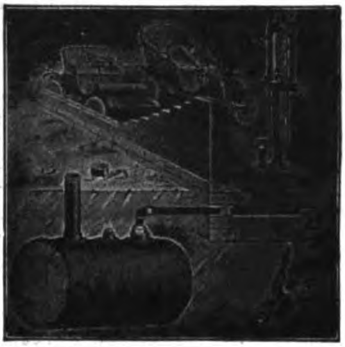
Many Chains have been ruined by interference with gear cases, cross bars, sprocket hubs, etc.

Interferences must be eliminated if good results are expected.

Sprocket teeth should be cut to the correct bottom diameter, accurately spaced, and must not be too wide for the width of the chain. On request we will furnish blue print giving our ideas regarding width of sprockets and shape of teeth.

THE WHITNEY MFG. CO. HARTFORD, CONN.

Bowser Gasolene Storage Outfits



The Bowser Long Distance Gasolene Storage System

Tank Buried Pump in Building

We Manufacture Many Different Styles

Over 250,000 now in use

We manufacture gasolene storage outfits,—all kinds,—self measuring outfits for garages; smaller, less expensive ones for private automobilists.

If you use any quantity of gasolene, no matter how small, you will find in our catalog a tank exactly suited for your purpose.

We shall be glad to send you a descriptive booklet. Ask for it, for it contains some interesting facts regarding the proper storage of gasolene.

Catalog T sent upon request.

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EASTERN OFFICE: 255 Atlantic Ave., Boston, Mass.

American Veneer Company

112 MARKET STREET, KENILWORTH, NEW JERSEY

MANUFACTURERS OF

Laminated Woed Automobile Mud Guards

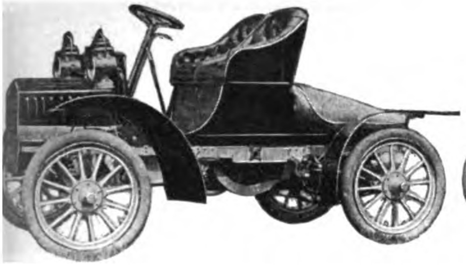
ANY DESIRED LENGTH OR WIDTH
NEW SIDE DOOR STYLE, No. 95

REAR GUARD, STANDARD SIZE
Length, 50½ Inches. Width, 8 Inches

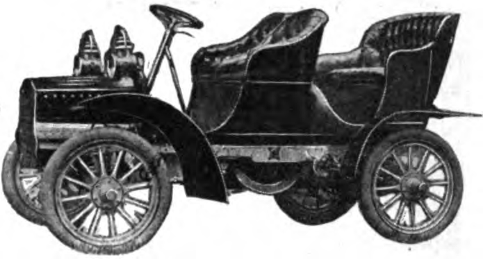
FRONT GUARD, STANDARD SIZE
Length, 46 Inches. Width, Top, 7 Inches
Bottom, 14¾ Inches

The laminated guards are made of three layers of whitewood, each one-eighth inch thick, glued together and the grain of the middle layer running crosswise and at right angles with the grain of the outside layers, thereby avoiding splitting and cracking :: :: ::

WRITE FOR PARTICULARS *WRITE FOR PRICES*



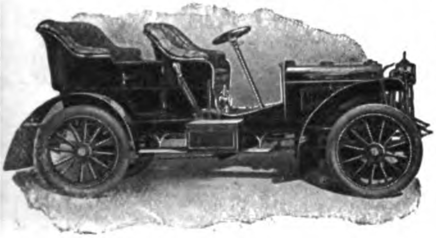
Model E Cadillac with Tonneau closed



Model E Cadillac with Tonneau open

RTZ FOLDING TONNEAU The above illustrations show one and the same car, a Model E Cadillac, fitted with the Artz Folding Tonneau Can be opened closed in ten seconds ; no part detached, strong, comfortable, noiseless, keeps clean when closed and adds only 70 unds to the car. We furnish it complete with rubber covered floor and a step for **$100.**

Delivered and attached to your car. **DAYTON FOLDING TONNEAU CO., 1143 North Main St., Dayton, Ohio**



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Steel Chassis, full aluminum body, compound engine and condenser. No heat under seats. All functions pertaining to power generation automatic.

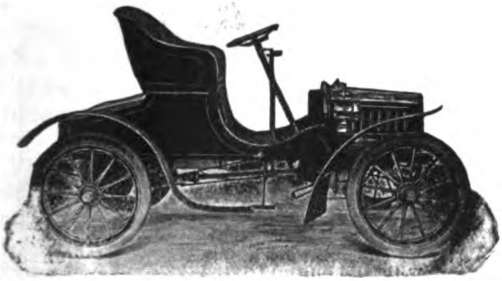
A new type of boiler possessing the economy and progressive heating advantages of the flash, but carrying the constant pressure and having reserve of power common to boilers having a water level.

PRICE, $2250. Manufactured by

LANE MOTOR VEHICLE CO.

POUGHKEEPSIE NEW YORK

New York Representative,
W. G. RICHARDSON, 516-518 West 145th Street



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It made many wonderful touring records last season, but will surpass them all this season. The 1905 model is a wonder on the roads.

If you want a light and reliable car for a low price the Covert fills the bill.

It has an upright motor, sliding gear transmission, shaft drive. It is easily the most comfortable runabout on the market, for it has a long wheel base and wonderfully easy springs.

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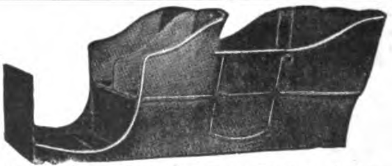

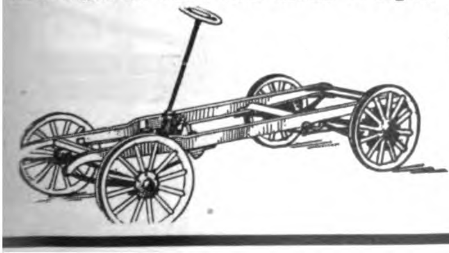

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to build your own auto running gears and are they up to date? We make a specialty of this class of work and make it right. Get our new catalogue at once and see our latest styles. We also make all kinds of bodies, wheels, axles, steering devices, sprockets, etc.

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LIQUID
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"DON'T SCRATCH"

YOUR AUTO TRIMMINGS AND LAMP REFLECTOR
BY USING CHEAP POLISHES

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are absolutely free from all Acids and Grit, and are made to fill the req
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Write us for testimonials from prominent Automobile Manufactu
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Warranted to give entire satisfaction. Samples upon

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Special Quotations to Dealers

This is the only Metal Polish on the market made exclusively for Auto

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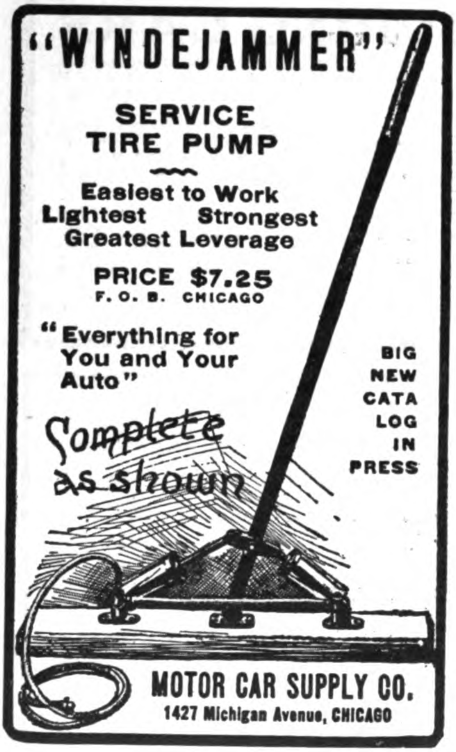

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Any man can put this on the end of
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we will send one on trial.
We guarantee them.

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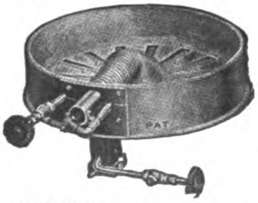
Main and Globe Streets **PEORIA, ILL**

OFELDT'S STEAM AUTOMOBILE SPECIALT

DO NOT FAIL TO SEE

Our Specialties in Operation at the Armory Auto Show, New York
(IN THE BASEMENT)



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Noted for its simplicity. Only 60 lbs. air pressure required. Costs one cent per mile for fuel. Increases speed of car 25 per cent. Adapted for any car.

Safety Water Tube Water Level Boiler

Cannot burn out

Gives Superheated Steam

Does not require a Gauge Glass

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Has a reserve when a hill is reached.

Built by Boiler Makers of 20 years experience.

Combines all the Strong Points of the Flash Type with those of the Water Level.

AUTOMATIC WATER REGULATOR

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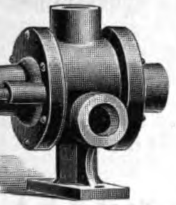
The Lobee Circulating Pumps



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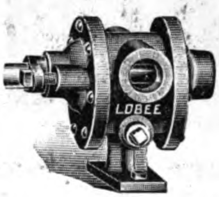

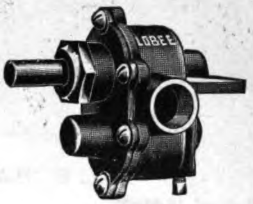

Have a train of satisfied users everywhere. Are the most universally endorsed of any pumps made. Give a positive forced circulation to the cooling water or oil on all gasoline motors. If you want good circulation on your automobile, launch or motor boat, use a **LOBEE PUMP** and not an imitation. Easily attached, nothing to get out of order. There are more Lobee Circulating Pumps in use than all other makes combined, which demonstrates their efficiency and durability. Made in iron and bronze. From ½-inch to 1¼-inch suction and discharge.

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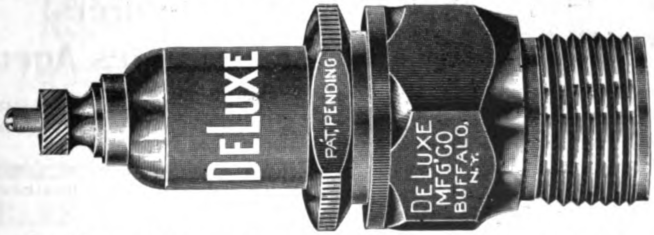
SOOT, OIL, SHORT CIRCUIT AND FOOL PROOF

No Freak Ideas

The Plug of uninterrupted spark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Durability and more insulation makes them superior to all others.

Sent to any part of U. S., $1.50

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DON'T throw away those weak Batteries, they are good and worth money.

25 to 50 per cent. your Battery cost reduced or a like increase in mileage run by the use of an entirely new, but not an experimental device.

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The "ECONOMY" Automobile Switch

It pays for itself on first installation. Guaranteed, Positive, Simple, Substantial, Ornamental. No short circuiting; no harm to coils. *Does the trick, besides has all the good features of other Switches.*

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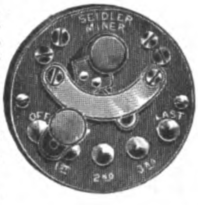
Sample by mail on receipt of price, $1.50. Discount to the trade. Money refunded if not satisfactory.

Automobile manufacturers are now adopting these switches. They make Dry Batteries the cheapest, simplest and most logical for ignition



Manufactured by **SEIDLER-MINER ELECTRIC COMPANY**

205 Jefferson Avenue DETROIT, MICH.

Hood's, Fenders, Tanks, Mud Guards & Metal Dashers

IN GERMAN SILVER, BRASS, COPPER, ALUMINUM or STEEL

COPPER PIPE CONNECTIONS

FIRE EXTINGUISHERS FOR GARAGE AND AUTOMOBILE

For Prices apply to

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To Play Turn Bottom Up
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Established 1841

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In order to meet the constantly increasing demand for

The Kells Honeycomb Cooler

we have been forced to remove to larger quarters. We are now in position to fill orders promptly and solicit your patronage.

W. J. KELLS MFG. CO.
New Address, 62 Van Winkle St.
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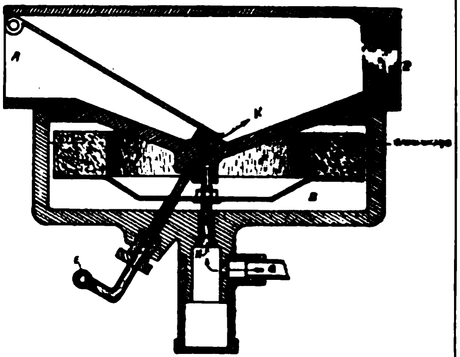
Manufacturers of Honeycomb Water Coolers. High Grade Disc Radiators, Aluminum Dashboards, Radiating Washers, Gasoline Tanks, Mud Guards, Mufflers and Hoods.

Automatic Carburetors



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Write me concerning the manufacture or sale of this carburetor. Absolutely automatic.

Blue-prints, samples or descriptions sent to those who mean business.

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We have been building bodies for 36 years, and can give you the best that can be obtained, in design, material and workmanship. Our capacity is 15,000 per annum, and our equipment cannot be excelled. This means prompt deliveries on dates promised.

AUTOMOBILE TOPS and STORM-FRONTS

We are building up a large business in this field, because our tops and storm-fronts are designed right, manufactured right, and sold right.

Let us figure with you on your requirements in this line.

Columbus Buggy Co., COLUMBUS OHIO

ATTENTION Automobile Manufacturers!

We have perfected a new system for trimming and upholstering Automobiles, by which we can save you money.

Write us for particulars.

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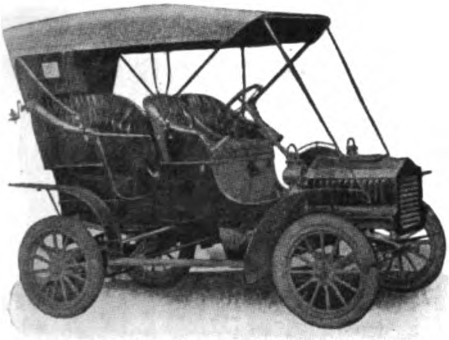
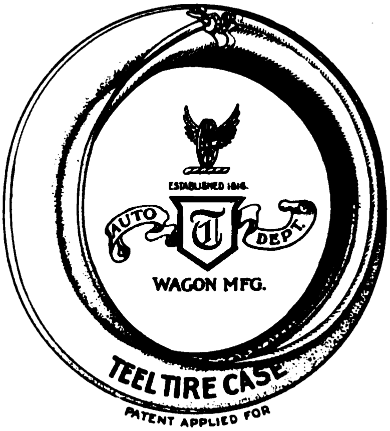


Automobile Tops
Automobile Tops Recovered
Launch Tops and Spray Hoods

CHARLES P. McCLELLAN
FALL RIVER, : : : MASS



A water and dirt proof tire cover held in place by two steel wires, doing away with all lacing. It is the easiest attached cover on the market.

Send for circular.

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A Leather For All Kinds Of Weather
Chrome Tanned Automobile Leather

Chrome tanned leather is soft and pliable.
Chrome tanned leather is light and strong.
Chrome tanned leather will dry out soft after repeated wettings.
Our finish is water proof.
Our finish will stand cold.
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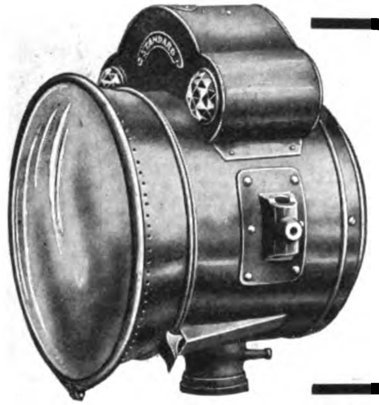
Our leather is dyed same color as finish.
Our leather works better and wears better than hand buffed or machine buffed bark leather.

The LACKAWANNA LEATHER CO., Hackettstown, N. J.

We also make a heavy chrome leather for tires.



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All goods strictly high grade and guaranteed. The most complete line in its entirety offered for 1906, and all, for only a little more money than is asked for the kind that adds to your troubles. Write for new illustrations and prices.

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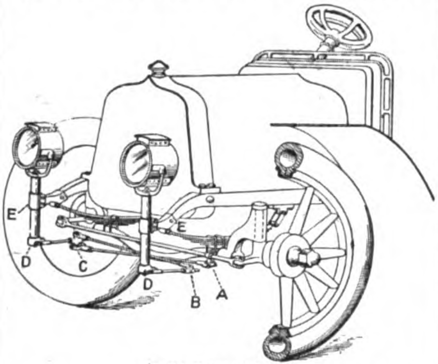

(PATENT APPLIED FOR)

with an unseen obstruction around the bend, if your lamps ride on

THE IMPERIAL-LYON
Automatic Lamp Adjuster

because

"It Lights a Turn Before You Make It."

It not only shows what's ahead but what's around the corners.
Is attached to steering knuckle rod and moves with it.
Adjustable to move as fast or faster than the wheels.
An absolute necessity, yet a source of everlasting satisfaction.
Our circular telling all about it and price on request. Write for them.

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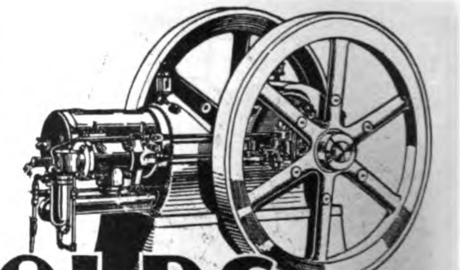

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THERE is no gas engine as simple as an Olds—compare it with others and this statement is proved. The REPAIRS COST PRACTICALLY NOTHING. Every adjustment is very simple to make.

Exact duplicates of any part can be furnished at once, perfectly machined and ready to put on. This is important in case of accident.

The Most Economical Engine

For Machine Shops, Repair Shops, and Automobile Garages.

Our reference—The User—The Man with an Olds. The reason why is interestingly told in our catalogue mailed on request. Tell us your requirements and WE WILL HELP YOU figure out what you need. Send for our catalogue showing Type A. (2-8 h. p.) Type G (8-50 h. p.), Type K. and N (12-120 h. p.) used with our Gas Producer, it will reduce fuel cost 75 per cent.

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PATENTED JULY 28th 1868

Look out for Yellow Label.

Use Albany Grease

FOR YOUR AUTOMOBILE

It Is the Best, Cheapest, Cleanest and Safest Lubricant Known.

It will not gum, prevents rust, reduces friction, does not drip, prevents hot boxes, keeps your motor in perfect running order, saves expenses and repairs and will not freeze.

It is the Standard Automobile Lubricant and is used by most manufacturers of automobiles to start their new machines.

Use No. 2 grade for Winter and No. 3 for Summer. For transmission or ensemble gears, use No. 1 in Summer and No. 0 in Winter. The quality of the grades is the same; the difference is only in consistency.

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"PERFECTION"

Force Feed Oiler

The only one not dependent upon gravity or pressure. Positive lubrication is always maintained, and hot bearings are an impossibility.

Call to see us at Space 119, Madison Square Garden Show, and let us demonstrate it to you.

Auto Brass & Aluminum Co.
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Force Feed Lubricators

Made or any capacity, any number of feeds. Either rotary or ratchet drive and of finish desired. We publish a booklet giving a lot of information about oiling and oiling devices. We will gladly send this for the asking.

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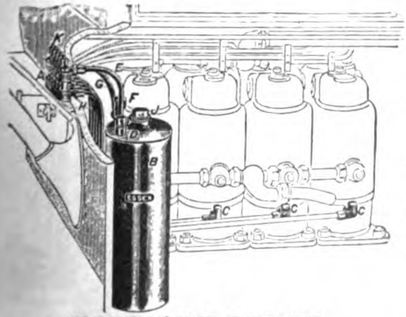

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Automatic

Lubrication is the only successful method of lubricating **Automobiles. Always ready** and never get out of **order. 20,000** in use.

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THE AUTO ACCESSORIES MFG. CO.

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STERLING BRAND

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Auto Caps
Rain Aprons
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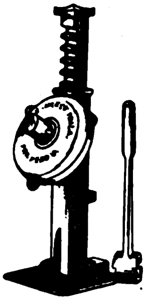
Globe Automobile Jack

Light and Powerful



Simple and Positive

The **GLOBE AUTOMOBILE JACK** is the most reliable jack made. There is no intricate mechanism to get out of order, since it consists of only two working parts, **a rack and worm of peculiar construction.** It is always locked in any position and cannot slip. Being but 10½ inches high, it takes up very little space when carried in the automobile. It is made of the best grade of malleable iron, and is light, powerful and compact.

The **GLOBE JACK** will fit under the axle of any 28 inch wheel, which makes it very convenient for shop use, where machines are handled before tires are put on. As it will lift to a fraction of an inch, it can be utilized to adjust parts of machines and bodies into place. It is adapted to any style of machine, and will handle the heaviest automobile made.

Discount to the Trade

MANUFACTURED BY

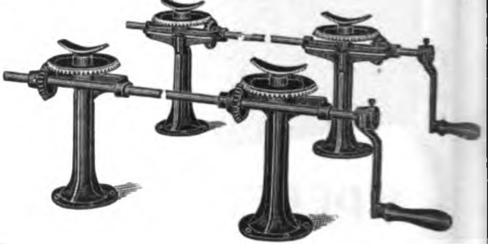
Globe Jack Company

827 N. Fourth St. **Philadelphia, Pa.**

Rest Your Tires

with a "SPRINGFIELD" LIFT

You turn the cranks and the four wheels will rise 7 inches off the floor

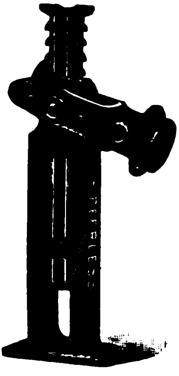


Showing lift in position to receive car. Actual lifting capacity 3500 pounds. Write for descriptive circular and price.

The Shawver Co.

SPRINGFIELD
OHIO

E. J. DAY & CO., Pacific Coast Agts, San Francisco



Peerless Automobile Jacks

A model of simplicity, durability and strength. Raise by working handle below center; lower by working handle above center. Works at any angle. Can not slip or drop.

Most Popular Auto Jack on the Market.

	Height	Rise	Weight	Price
No. 15—For vehicles of 2 tons.	10-in.,	7-in.,	4½-lbs.	$2.50
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No. 18—For vehicles of 3 tons.	13-in.,	8-in.,	9-lbs.	4.00
No. 21—For vehicles of 10 tons,	13½in.,	7-in.,	21-lbs.	6.00

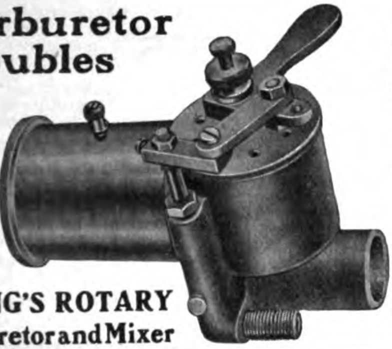
OLIVER MANUFACTURING CO.,

202 S. Desplaines Street, **Chicago, Illinois**

PEERLESS
MARCH 14 1905

Carburetor Troubles

Vanish
Into
Thin
Air
When
You
Use



YOUNG'S ROTARY
Carburetor and Mixer

A Little Device with a Big Record for Saving

We have three very important points of superiority over all other carburetors made:

1. We use no float feed. You cannot flood your engine if you try.
2. We can run your Auto five miles farther on one gallon of gasoline than any other carburetor made.
3. We overcome the annoyance of sooted plugs.

We forfeit the price of the carburetor and $10 in addition for every case where we fail to make good our claims.

Patented in all countries.

Write to-day for descriptive booklet and prices.

CULVER NOVELTY COMPANY
Patentees and Manufacturers CULVER, IND., U. S. A.

Walker Carburetor

The only carburetor which can be adjusted to positively give any desired ratio of gasoline to air throughout the throttling movement.

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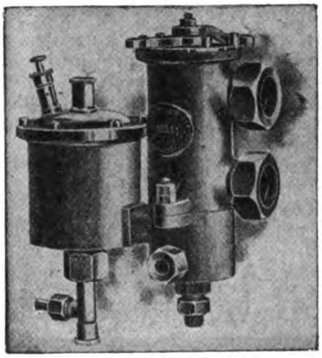

THE IMPROVED AND SELF-REGULATING LONGUMARE CARBURETOR

REASONABLE AND PRACTICABLE

The Longumare Carburetor has been for the last nine years the Standard Carburetor of the World. Nearly every present day carburetor is an imitation of the principles of the Langumare Carburetor.

Why spend your money on experimental carburetors when you can buy one which has proven its value by nine years practical usage. We should be pleased to correspond with you.

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Sole Licensed manufacturers in the United States of the Longumare Carburetor.
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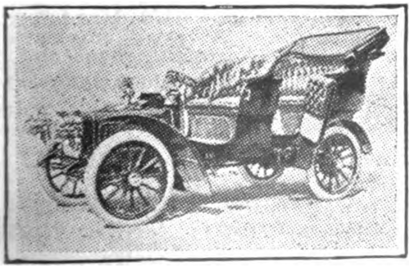

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Agents for "Upton Automobile"
Perfectly Simple and Simply Perfect
Storage and Repairs
A Postal will bring the Machine to Your Door
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MUFFLERS FOR 1

The new model "Weeber Muffler" has used by some of the largest automobile r facturers for the past year and gives bette isfaction than any muffler on the market. very quiet and will positively increase th ciency of your motor. If you have had tr with mufflers, try a Weeber. We carry a s 1½ inch muffler in stock that greatly increases the efficiency of the 1902, 1903, 1904 Winton ar nish diagram for attaching same. Our facilities are such that we can make deliveries i quantity without delay. Get in touch with us. It means money to you.

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Every user and dealer of Winton cars should investigate this special 1½ inch muffler will make a new car of your old one. We guarantee satisfaction or refund money.

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It will pay you to keep in touch with us. We are direct factory Selling A for many standard Automobile supplies and specialties. In dealing with us eliminate the Importers' and Jobbers' profits. Write us for quotations on

- ALPHA AND SEARCHLIGHT TYPE LAMPS
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Respectfully yours,

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FIRST-CLASS FACTORY ACCOUNTS SOLICITED.

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New Goods **Overstock**

SINGLE TUBE

28x2½	$10.00	each, regular price	$20.00
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Every size in stock.

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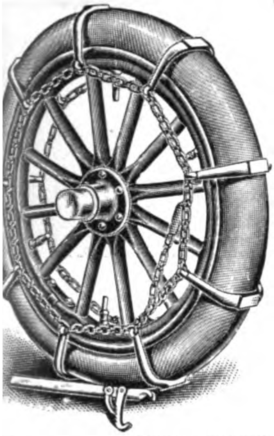

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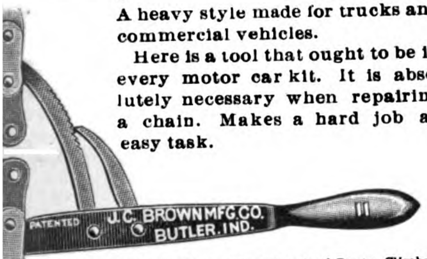
A heavy style made for trucks and commercial vehicles.

Here is a tool that ought to be in every motor car kit. It is absolutely necessary when repairing a chain. Makes a hard job an easy task.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STEEL BELT

for oil-pump or fan

makes the oiler work right; keeps the fan going and the cylinders cool. Strong, pliable, don't stretch or break.

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Get it of your auto dealer. If he hasn't it, send us **$3** and the length of present leather belt with make and year of your car, and we'll send a Powco Belt by return mail.

Your money back if you don't like it. Send anyway for circular E.

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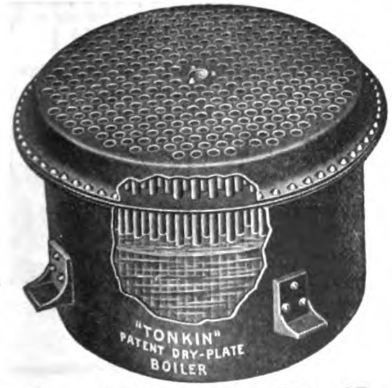

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will add 50 per cent. to the efficiency of your steam car. It has a **PATENT DRY PLATE** which delivers steam to the engine **perfectly dry,** and an **Expansion Joint** which absolutely prevents leaking. The present model is the fruit of twenty years' experience, which is a good guarantee of its giving satisfaction

We can supply all sizes and styles.
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TONKIN BOILER CO.
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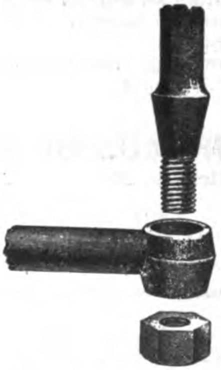

The best possible support for Canopy and Cape Tops. Made from ¾ inch round steel. Used extensively by the largest top manufacturers.

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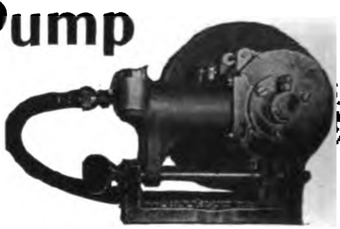

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Use the P. T. C. Power Tire Pump, driven by friction from fly-wheel of engine.

SINGLE CYLINDER 1906 MODEL, $15

Write for Circular C

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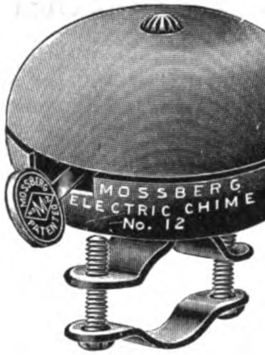

We make a very extensive line of bicycle and auto bells, all of which give practical illustrations of "sound" construction, and which, by their variety and peculiar sweetness of tone, never fail to gain the interested ears of those who hear them.

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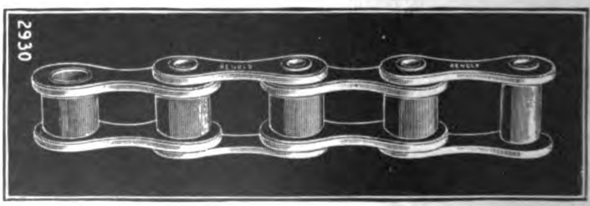

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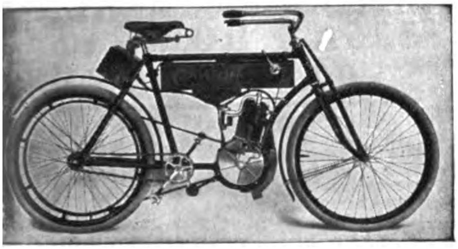

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NEW MODEL B

Tires, 2 inch Dunlop or G & J Goodrich

THE MOST SATISFACTORY MOTOR CYCLE BUILT. Adapted for long distance, long wheel base, automatic float carburetor, single throttle control, 1½ in. double belt, gasoline and oil 150 miles. Three horse power motor; weight, 130 pounds; new style muffler, with cutout. This machine will run 150 miles without a stop. Write for circulars.

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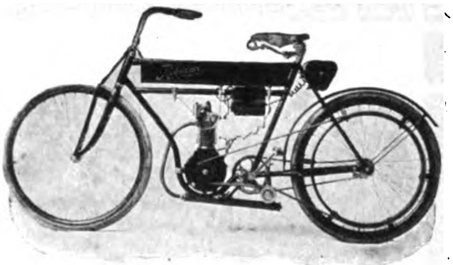

A genuine motor cycle, 2 H. P., 110 lbs. scale weight, 54" wheel base, beautifully balanced, vibration practically eliminated, grip control, sight feed oiler, 1¼" Russian rawhide, double thick, stitched, water proof belt, noiseless, clean and perfect in transmitting power and practically non-stretching. We want live enthusiastic agents, who realize the tremendous future of motor cycles. Get advance sheet No. 1.

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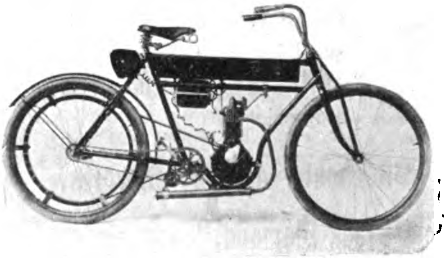
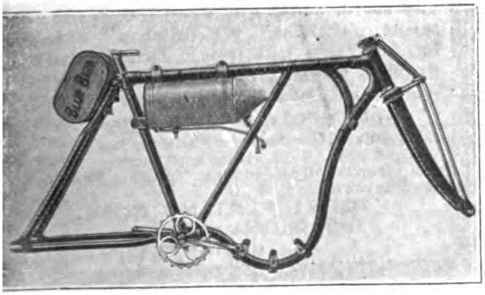


Geer Bluebird Frame
Suitable for any size engine



SPECIFICATIONS

Wheelbase, 51"
Height, 20", 22", 24", 26".
Tubing, 10 ga. Curved bar, 14 ga. Balance.
Forks, trussed 1⅛" x ⅞"–x 10 ga.
Hanger, three piece export style.
Head, special re-enforced.
Hanger bracket, offset for belt.
Seat-post lug, " " "
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Lubricating tank, " 1 pt.
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Fork only, $8.00.
Frame, fork, tanks, $48.00,
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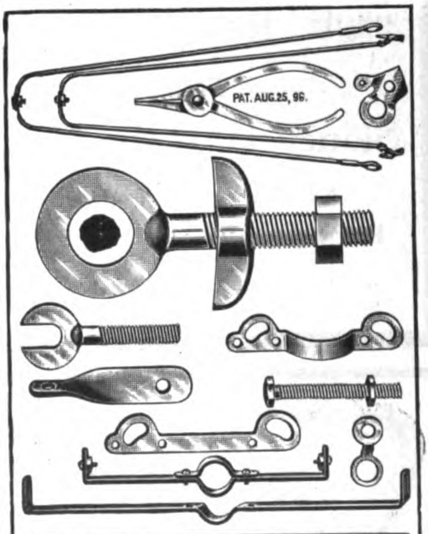
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Chain Adjusters, Mud Guard Braces, Chain Guard Braces, etc.

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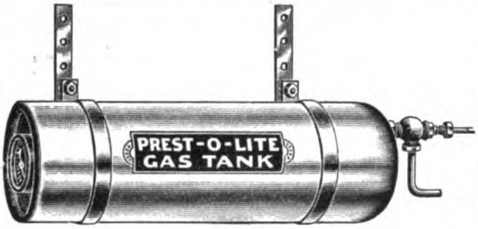

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It's the right price for the tank and a good light on your automobile. Some people burn a tank of gas in three weeks and others use only one tank in three months. More than 7000 in use and we have in our files a string of unsolicited testimonial letters from one-third of these buyers.

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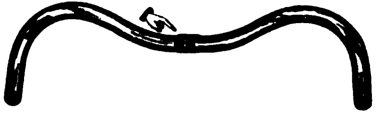
A large stock of "Continental" tires and Weed Grips constantly on hand.



Ideal Handle Bars for Season 1906

are made in styles to suit all. We make forward extensions and straight expander stems in forgings and malleable castings ¾, 13/16 and ⅞" sizes. Forged straight stems 3", 5" and 10" long; forward extension forgings with 2½", 3½" and 5½" forward throw and 3" down stem. The malleable cast straight stem only 4" down stem, and the malleable cast forward extension 3" forward throw and 3½" down stem.

BAR TOPS

made in all our popular styles 20" and 22" wide. We will make special bars any style, width and drop if ordered in large quantities. We finish all of our bars in two qualities: Our medium finish is a heavy nickel plate on strike copper; our best finish a heavy nickel plate on buffed electrotype copper, and will stand the weather much better.

We can suit all on goods and prices. Write for circular and prices. Agents wanted everywhere.

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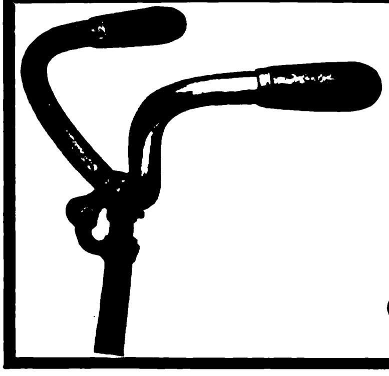

Hussey Handle

the most complete line for 1906 ever offered.
New Shapes. New Features.
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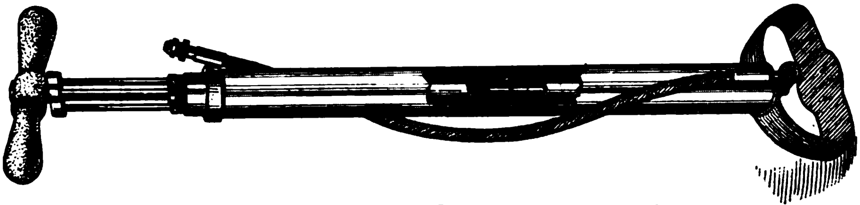
"THE PUMP TOO GOOD FOR ITS PRICE"

$3.50 F. O. B.



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AUTO TOP BRONZES,

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Mud Guards

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we can help you out.

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ATLAS EXTRACTOR OF BROKEN TAPS

A strong and simple device for removing taps broken off in a tapped hole. Works quickly and easily and will not injure the work. A time and money saver; always ready for instant use.

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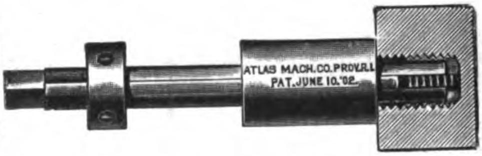
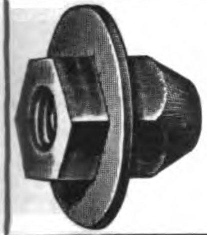
Also makers of the **Atlas** Swivel Vise and **Atlas** Tool Maker's Vise



ATLAS MACHINE COMPANY, Providence, R. I.

THE TWO STANDARDS



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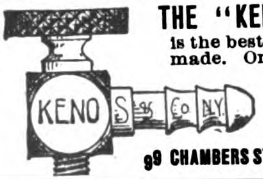
Sample Mailed for 10c.



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is the best pump nipple ever made. One sample for 15c.

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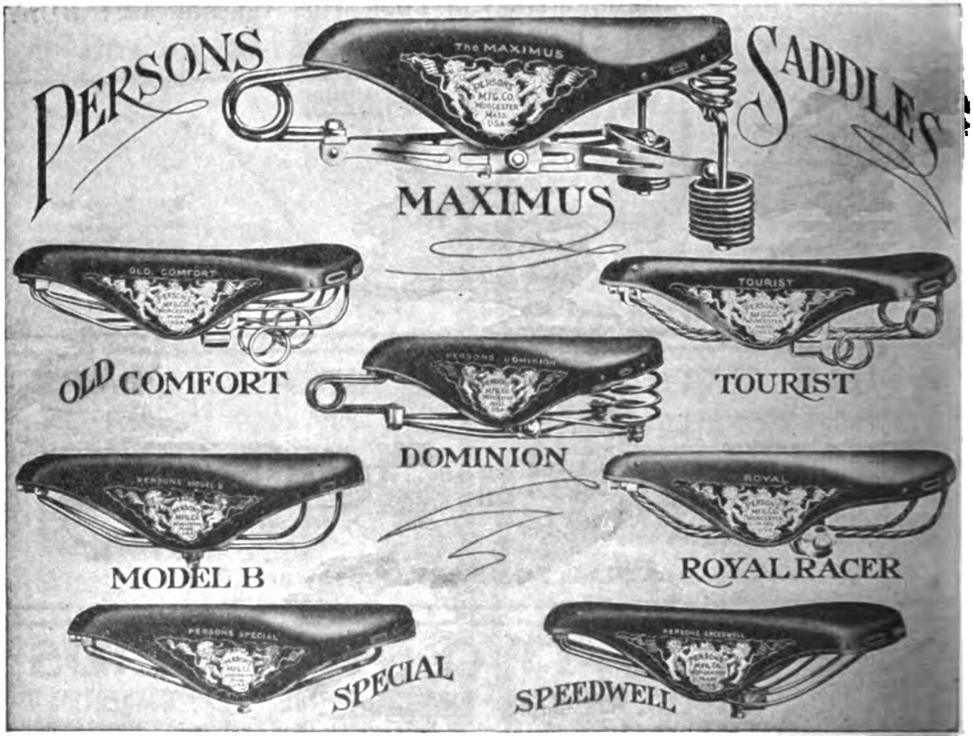
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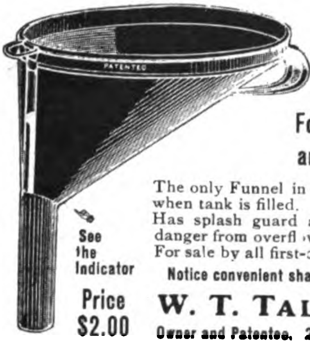

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Has splash guard and seine, removes danger from overflow
For sale by all first-class dealers.

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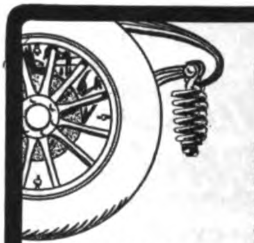

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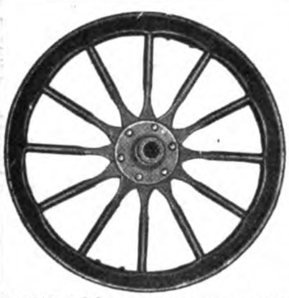

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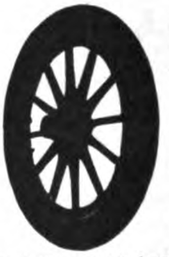

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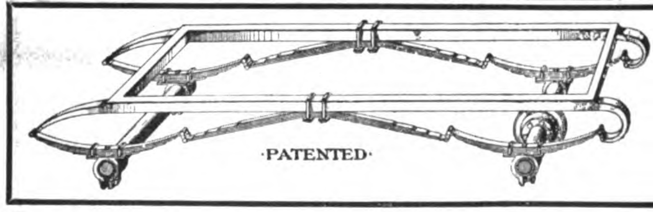

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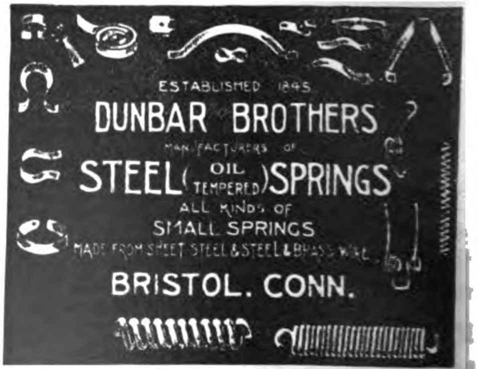

ESTABLISHED 1845
DUNBAR BROTHERS
MANUFACTURERS OF
STEEL (OIL TEMPERED) SPRINGS
ALL KINDS OF
SMALL SPRINGS
MADE FROM SHEET STEEL & STEEL & BRASS WIRE
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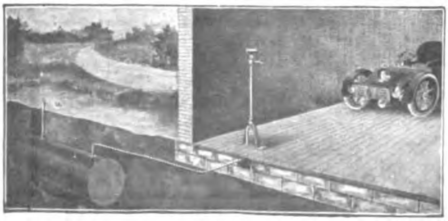

THE AUTO GASOLINE STORAGE OUTFIT

Just the thing for the private user

Holds 1 barrel of Gasoline
Send for circular and price

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ELECTRIC HORN

PRESS THE BUTTON, NOT THE BULB

This electric attachment can easily be applied to any horn.

Price, $5.00

B. & J. Mfg. Co.
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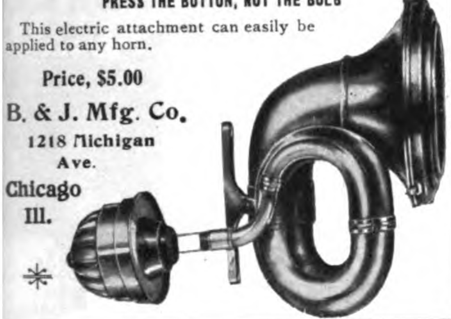
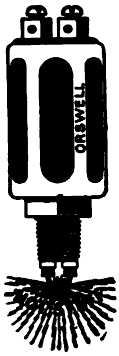




Placing only a diving helmet on your head does not prevent you from getting wet if you should fall overboard, any more can you expect a cap on an ordinary spark plug, prevent it from short-circuiting, when the rain or spray strikes the plug or wiring from every direction. Get the

ORSWELL SYSTEM OF IGNITION

which is complete in itself and designed throughout, so it cannot short circuit, for the simple reason that there is no current in the wiring or connections, of sufficient strength to close a bridge formed by water. And yet it is a jump spark at the sparking points.

ORSWELL IGNITION CO.
102 Pearl St. Boston, Mass.

MODEL B

"Snapit" Lock Switch

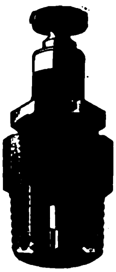
For Automobiles
Motor Boats
and Launches

Thief, Dust and Waterproof

Sent on receipt of price, **$2.00**

Address F. A. GOEBEL, Marietta, Ohio
Quantity price to dealers and manufacturers

Pat. March 14



ALBRIGHT Spark Plug is ALL-RIGHT

It is built on entirely new and common-sense principles. This "Sho 'Nuff" plug is one that will not soot. It sparks in oil and cannot be fouled. **Your Money Back after Thirty Days' Trial,** if you are not satisfied. Order an **ALBRIGHT,** and neither you nor your plug will go wrong. Improved 1906 models now ready. Book of testimonials sent for the asking. If your dealer won't furnish them, order direct from us.

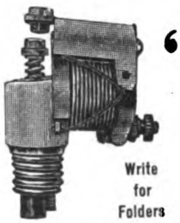
Albright Mfg. Co.
(Inc.)
Columbus, Georgia

DO IT NOW!

Install a Driver Switch in your Automobile or Motor Boat and avoid future trouble. Easily connected up and secured Removable key.

Send for circulars.

More-Power Co., Lowell, Mass.



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THE "S and C" Primary Exploder Plug

is the result of seven years of experimenting. An S. & C. Plug and a set of batteries constitute the whole ignition outfit. A bright and troubleless future is before the user of these plugs. Your money back if they don't work.

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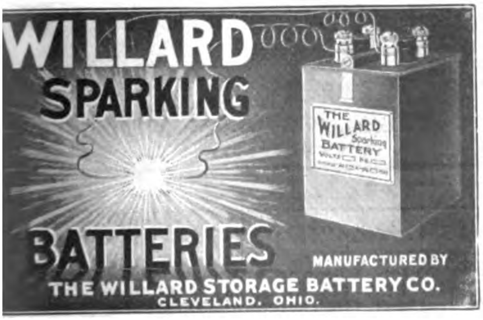

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MANUFACTURED BY
THE WILLARD STORAGE BATTERY CO.
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"WE WIN"

Our Dry Battery is Unequaled

THE HELM BATTERY

We Burn Broken Aluminum Castings

The H. WILHELM BATTERY COMPANY
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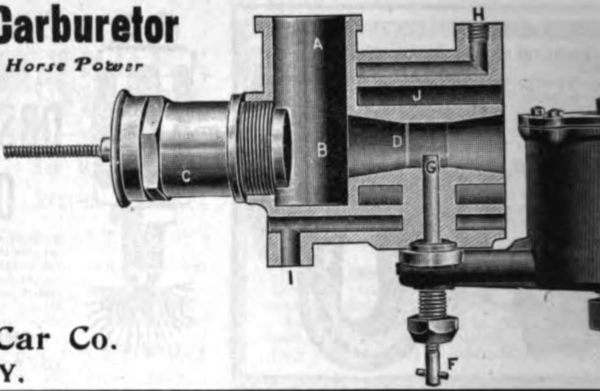
The Ardsley Carburetor

For Motors above 20 Horse Power

A powerful, efficient carburetor without automatic valves or springs.



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FISCHER SPARK COILS AND PLUGS

Reliable, well made and handy adjustments.

Pamphlets for the asking.

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Eastern Representatives, W. K. THOMAS & CO.
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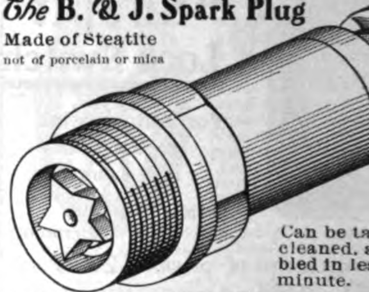
30 Days Free

The B. & J. Spark Plug

Made of Steatite
not of porcelain or mica



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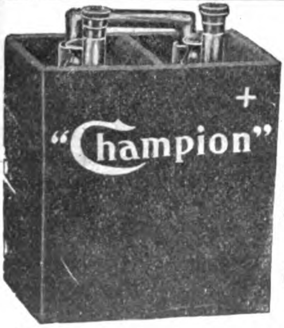
It's the SPARK that cou

Write us for particulars.

The INDUCTION COIL CO. MILWAUKEE,



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For Ignition

Type "6-20," (6-volts, 20 ampere-h'rs) 8"x4"x7" high. Most suitable for Auto work.

PRICE, $10.50.

Discount to the trade.

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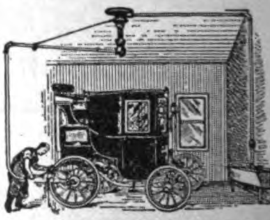
HECTOR MacRAE, 314 St. Paul St., Baltimore, Md.

Carriage Washing Ma

"Our Utility"



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See How Easy It Is To W

Your Carriage or Automobile With the "IDEAL" Carriage

Wear gauntlets if you wish. They will not get wet. No Cold Hands, No Shiverin
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Construction is such that it will last a lifetime. Made of solid brass. Imposs
or injure the finest finish. Keeps the varnish glossy and bright. Guaranteed as represented
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SAMPLE FREE
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State size wanted.

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"ERICKA"

The Best Hand Soap Made for CLEANING the Hands or Clothing. Scouring Pots, etc.

Try it. Large Can, 10c.

At All Auto Stations. Beware of Cheap Imitations.

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REGISTERED IN PATENT OFFICES UNITED STATES, CANADA AND GREAT BRITAIN.
GAS ENGINE
LUBRICANT
MANUFACTURED ONLY BY
E. H. KELLOGG & CO.
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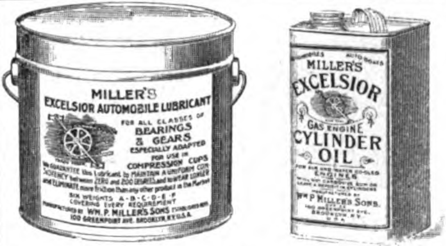
IS THE BEST FOR

AUTOMOBILES AND MOTOR BOATS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FOR ALL CLASSES OF BEARINGS & GEARS
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We know you are having trouble with Oils and Greases which refuse to lubricate in cold weather.

Excelsior Lubricant and Zero Cylinder Oil

will give you no trouble. Consistency remains unchanged in zero weather. Try them.

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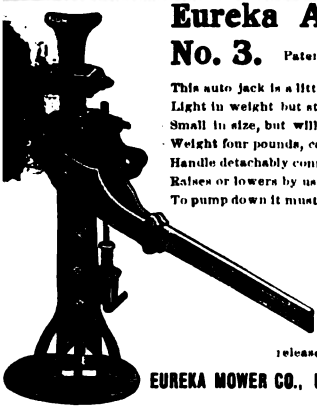


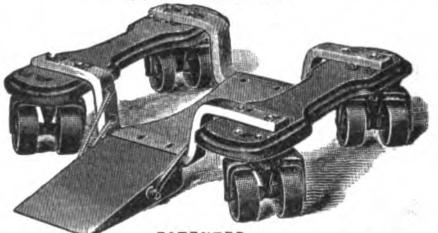
Eureka Auto Jack No. 3.

Patented September 22, 1903

This auto jack is a little wonder.
Light in weight but strong in lifting power.
Small in size, but will easily lift a heavy car.
Weight four pounds, capacity 2000 pounds.
Handle detachably connected.
Raises or lowers by using same handle.
To pump down it must be under a weight of at least 25 pounds.

Directions: To raise a weight, press down on the little steel lever and lock it out by turning to the right or left. To pump down release the little spring lever.

EUREKA MOWER CO., Utica, N. Y., U. S. A.



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FOR AUTOMOBILES

PATENTED

Will move the heaviest machines in the most limited space. Works equally well on the two front or two rear wheels. A time and money saver.

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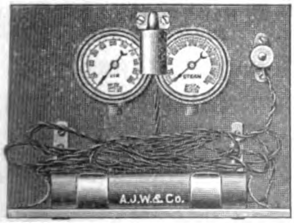
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A. J. W. Gauge Light

We were the originators of the gauge light. The light shown in the engraving is for the Stanley Steam Carriage. Write for particulars and prices.

When you buy see that the cover bears the stamp A. J. Wilkinson & Co., makers.

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Our Winter **SNAPS LIST** of Sacrifices is now ready and goods are offered at sacrifice prices.

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4½ H. P. Mobile Steam Engines.
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14 and 18-inch Copper Steam Boilers.
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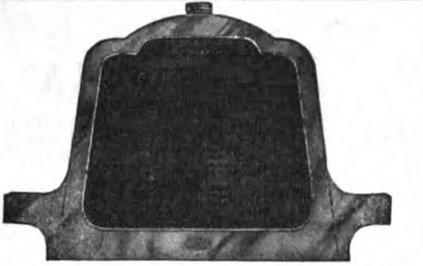
Copper Fuel and Water Tanks.
New Tubular Running Gears and hundreds of other attractive lots of goods you need.

Write us for the **SNAPS** lists.

NEUSTADT AUTO & SUPPLY COMPANY
826-830 South 18th St., St. Louis, Mo.



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Makers of the **"DETROIT"**
Hoods, Radiators, Tanks, Mufflers, Hollow Metal Dashes, &c.
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have been adopted by the leading manufacturers, for circulation of water and oil on automobile, marine and stationary engines. All sizes, with capacity from ¼ inch to 1 inch pipe.

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Used by the leading Automobile Builders
Manufactured by

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ACCURATELY **Because**
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A specialty of close work on automatic and interchangeable machine parts

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"A COOLER THAT COOLS"

Investigate this. It is positively the best cooler on the market today. Made of small square copper tubes. Does wonderful work. Great strength and durability. Wont clog up. Wont leak. If damaged by accident, broken tubes can easily be replaced in a few minutes.
We also make hoods, tanks, fenders, etc.
We have the goods and the price.
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Mechanical Engineers, Contractors and Manufacturers of Automobile Parts and Specialties

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Three and Four-Cylinders, Single Acting, Reversible Changeable Cut-off

The most practicable, compact and simple steam engine for automobile, boat and stationary use, and the only engine that can be used with superheated steam successfully. Engines in operation at our office.

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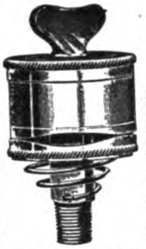

Automatic Automobile Lubricators

This engraving illustrates the grooved joint in body. In turning thumb screw at top one turn to the right, an extra amount of grease may be supplied to bearings. This cup is not affected by vibration, which is a very important consideration for this service and is more easily adjusted than any other Lubricator made.

Manufactured by **STANDARD GAUGE MFG. CO.,** SYRACUSE, N. Y.
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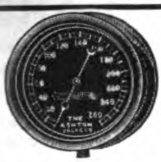
Pacific Coast Agents, GEO. H. TAY CO., San Francisco. S. W. Agent, AUTO EXCHANGE & SUPPLY CO., St. Louis, Mo. New York Agent, CHAS. E. MILLER. N. E. Agents, POST & LESTER, Hartford, Conn.



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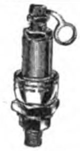
Highest Grade and Guaranteed Satisfactory. Pop Safety Valves, Cylinder Relief Valves. Specify and use **The Ashton** reliable fittings. Steam and Air Pressure Gauges, Automatic Water Gauges, Gauge Cocks, etc. Write for catalogue.



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273 FRANKLIN STREET BOSTON, MASS.
Branches: NEW YORK, CHICAGO ENGLAND: LONDON, E. C., 68 Crutched Friars

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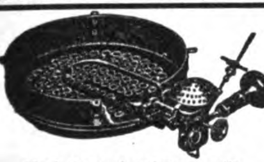

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THE FORG GASOLINE BURNERS

are the best and most reliable burners manufactured.
Burners for 14, 16 and 18-inch boilers are single compartment burners.
Burners for 20-inch boilers and larger are made with three compartments with a separate mixing tube for each. Write for catalogue.

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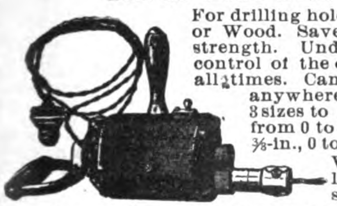

For drilling holes in Metal or Wood. Saves time and strength. Under perfect control of the operator at all times. Can be carried anywhere. Made in 3 sizes to hold drills from 0 to ¼-in to ⅜-in., 0 to ½-in. Weights, 12, 14, 19 lbs. respectively

Power from any Lamp Socket, Direct or Alternating Current.

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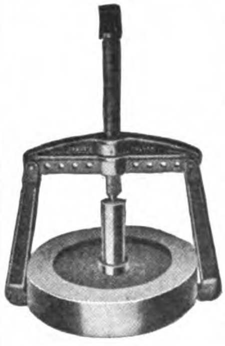

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Especially made for auto work in removing wheels, cams, fly wheels, etc. No repair shop complete without it.

PRICE, No. 3, - - - - - $9,00
" No. 2, one set of arms 7.20
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CRANE & RICHARDSON
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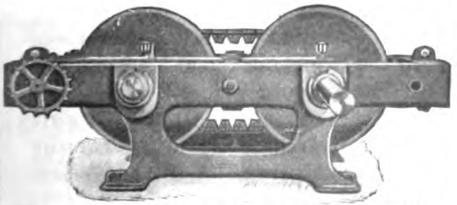
"The Reeves" Variable Speed Transmission



Particularly applicable to iron working tools, planers, milling machines, etc. Absolutely dependable.

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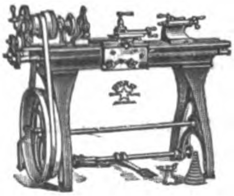
Foot or Power 9-in. to 16-in. swing



High grade screw-cutting engine. Lathes, with or without compound rest taper, draw-in, chuck milling and gear-cutting attachments, friction countershaft, metric lead screw, etc.

Send for catalog "B"

The Seneca Falls Mfg. Co.
416 Water St., Seneca Falls, N. Y., U. S. A.

We manufacture Large and Small Vulcanizers

The large Vulcanizer for recovering automobile tires weighs 2000 lbs.; price, **$100.** Small Vulcanizer for sectional work, including molds for all size casings, price, **$50.** Has a new feature, which is very important. It requires no air bags. Both Vulcanizers are operated by steam. We also do all kinds of vulcanizing on tubes and cases and recovering or retreading. Prices are from one-fourth to one-half cheaper than regular for equal quality of work.

Extra value in single tube automobile tires, 28x2½ **$10**; 28x3, **$12**; 30x3, **$13**; 34x2½, **$10**; seconds, **$2,** less each, clutcher tires and tubes, 25 per cent. off the American list. 4000 pairs 28 inch bicycle tires to dealers at **$2** a pair. These are seconds of a first-class tire and are extra heavy.

CHAS. E. MILLER
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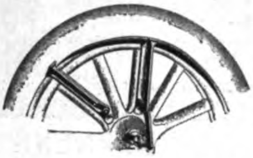
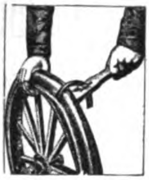


For replacing tires; impossible to pinch or cut the inner tube. Write for information and price-list.

W. J. ELLIOTT & CO., 185 Franklin St., BOSTON, MASS.



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THE BLANCHARD TIRE DETACHER

The only tool that does the work.

Light, handy, and durable. Price, $1.50.

Positively will not injure the tire, and is the only practical device for removing the outer casing. Send for pamphlet. **10 Clinton Street, Brooklyn, New York**

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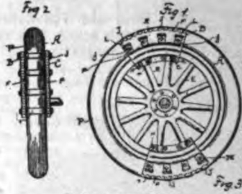

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Manufacturer of LICENSE TAGS

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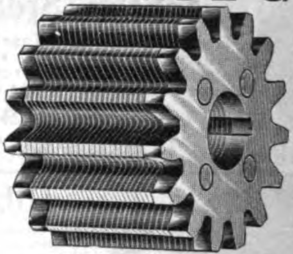

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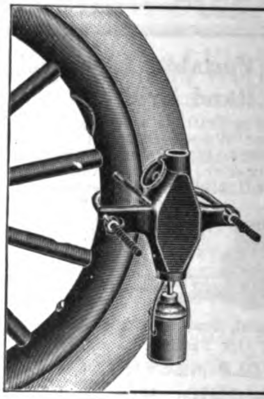
THE CHICAGO RAWHIDE MFG. CO., Chicago,
Branch Store, 39 Congress St., Boston, Mass.
Branch Store, 49 S. Forsyth St., Atlanta, G
Agent, Charles Bond, 529 Arch St., Phila



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HAVE YOUR TIRES REPA

We recover and remake old t
if the tire is not too badly used
Write us, our prices are reas
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Runabouts and Touring Cars

Solid brass slat irons for 4 bow extension tops with screws and bolts for attaching to long wood bows. Celluloid for curtain lights, 20 x 36 in.

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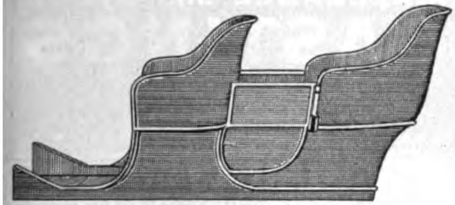

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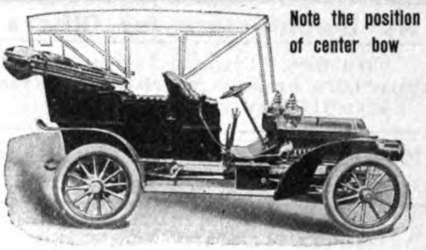

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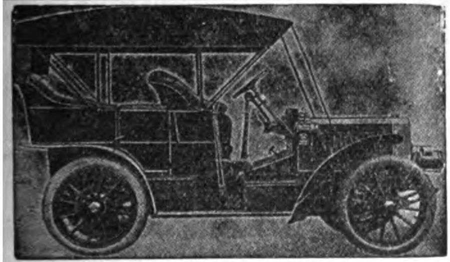

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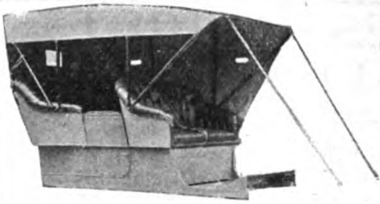

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CAPE TOPS
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TOPS
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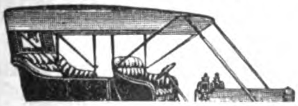

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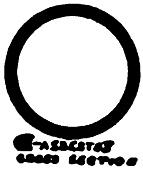

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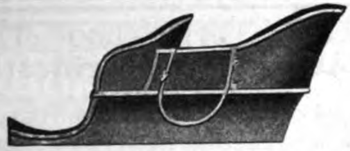

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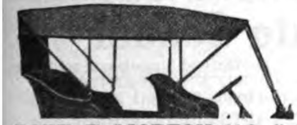
AUTOMOBILE TOPS



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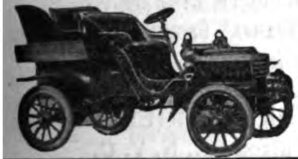

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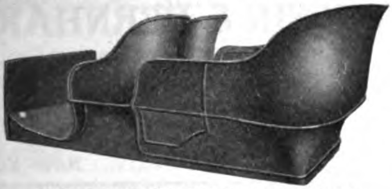

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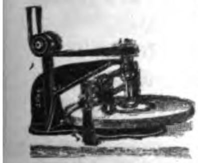

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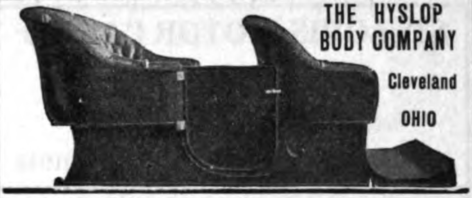

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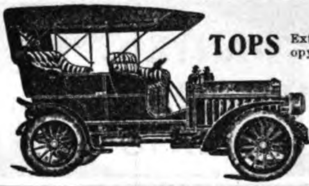

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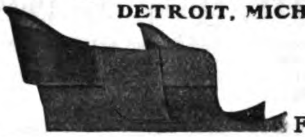

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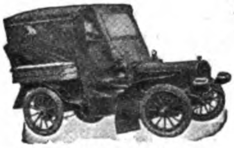

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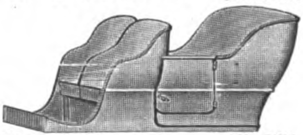

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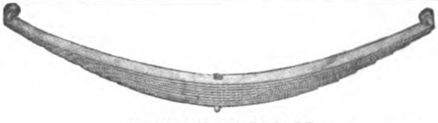

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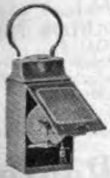

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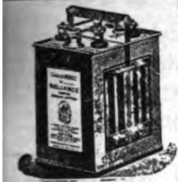

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Best Workmanship and Material. These Timers will
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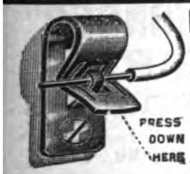

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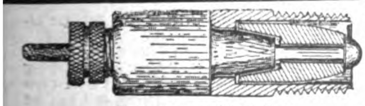

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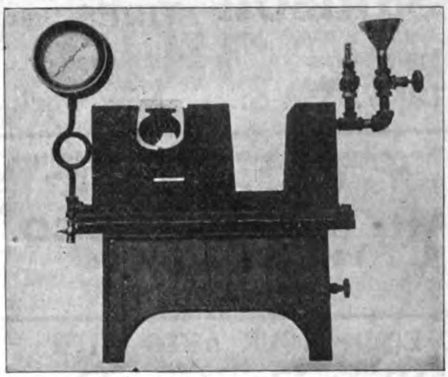

A Steam Vulcanizer that is up to date and one that every repairman needs. Moulds of extra length, 16 in., in sizes from 2½ in. to 4½ in., all makes and styles of tires. Special moulds made to order.

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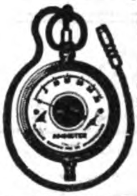

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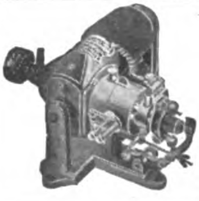

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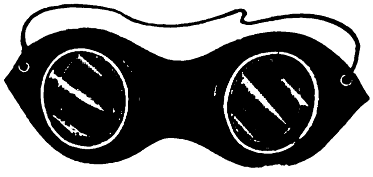

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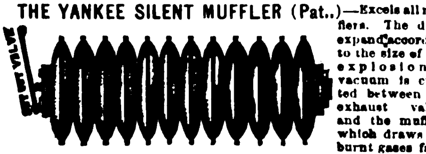

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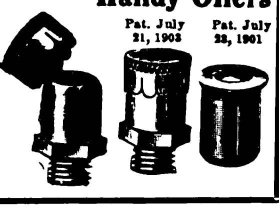

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BUYERS' GUIDE
OF THE
Automobile, Motor Boat and Cycle Trade

INDEX to this Guide will be found following last page of Guide.

NOTE.—The location of the advertisements of these concerns can be ascertained by eferring to advertiser's index on last pages of book.

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nerican Motor Co., 705 Center St., Brockton, Mass. (tricars and side trailers).
rmac Motor Co., 472 Carroll Ave., Chicago, Ill. (side car and delivery attachments).
irtiss, G. H., Mfg. Co., Hammondsport, N. Y. (side car attachments).
endee Mfg. Co., 216 Worthington St., Springfield, Mass. (Tricar).
otor Cycle Equipment and Supply Co., Buffalo, N. Y.
oddard, Wm. A., 10 Bellevue Ave., Providence, R. I. (Side Carriage.)
idmayer, T. B., 2312 Broadway, N. Y. City.
Eldredge Electric Mfg. Co., 227 Main St., Springfield, Mass. ("Eclipse").
General Electric Co., 84 State St., Boston, Mass.
Keystone Electrical Instrument Co., 9th St. and Montgomery Ave., Philadelphia, Pa.
Meyrowitz, E. B., 104 E. 23rd St., New York City.
More-Power Co., Box 175, Lowell, Mass., "M-P."
Pignolet, L. M., 78 Cortlandt St., New York
Robert Instrument Co. (The), 56 Shelby St., Detroit, Mich.
Splitdorf, C. F., 23 Vandewater St., New York.
Stanley, G. I. Electric Mfg. Co., 29 Broadway, N. Y. City.
Wagner Electric Mfg. Co., 2017 Locust St., St. Louis, Mo.
Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

Air Govenors for Carburetors.

ore-Power Co., Box 175, Lowell, Mass.

Aluminum Castings.

corn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
llyne Brass Foundry Co., Cleveland, Ohio.
luminum Foundry Co., Manitowoc, Wis.
uto Brass & Aluminum Co., Flint, Mich.
ake, Edwin J., Hartford, Conn.
idgeport Deoxidized Bronze & Metal Co., 429 Iranistan Ave., Bridgeport, Conn.
ssin, John E., Hanover, N. H.
ty Brass Foundry Co., Cleveland, Ohio.
um & Atkinson, Rochester, N. Y.
lumbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y.
e Wm. Cramp & Sons S. and E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
nterprise Foundry Co., Detroit, Mich.
rson-Carey Co., Lansing, Mich.
aham, Jas. & Co., New Haven, Conn.
feller Brass Foundry Co., 98-108 Terrace, Buffalo, N. Y.
feller-Brooks Aluminum & Brass Co., Fort St., E., Detroit, Mich.
mer Brass Works, 231 Race St., Philadelphia, Pa.
e Imperial Brass Mfg. Co., 245-247 S. Jefferson St., Chicago, Ill.
alamazoo Novelty Co., Kalamazoo, Mich.
ght Mfg. & Foundry Co., Union and Queen Sts., Pottstown, Pa.
zier Motor Co., 55th St. and Broadway, N. Y. City.
e Lunkenheimer Co., Cincinnati, Ohio.
cCord & Co., 84 Van Buren St., Chicago, Ill.
ack Bros. Motor Car Co., South Allentown, Pa.
ayo Damper Co., 355 Walnut St., Pottstown, Pa.
iller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
ational Car Wheel Co., Pittsburg, Pa.
oonan Tool & Machine Works, 103-105 Dominick St., Rome, N. Y.
rwalk Brass Co., Norwalk, Conn.
oneer Brass Works, 418-424 S. Penna. St., Indianapolis, Ind.
e Pittsburg Reduction Co., Pittsburg, Pa.
rovidence Aluminum Co., 460 Eddy St., Providence, R. I.
acine Brass & Iron Co., Racine, Wis.
erwood Brass Works, 1167-1169 Jefferson Ave., Detroit, Mich.
erwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
andard Brass Foundry Co., 1196-1200 Central Ave., Cleveland, Ohio.
andard Foundry Co., Hartford, Conn.
e Syracuse Aluminum & Bronze Co., Syracuse, N. Y.
S. Aluminum Casting Co., Vandalia Ave., Cincinnati, Ohio.
S. Aluminum Co., New Kensington, Pa.
ctor Metals Co., East Braintree, Mass. (aluminum bronze).
estern Motor Co., Logansport, Ind.

Ammeters.

nerican Coil Co., Foxboro, Mass.
nerican Electrical Novelty Mfg. Co., Spring, Hudson and Vandam Sts., New York City.
water Kent Mfg. Works, 42-46 N. 6th St., Philadelphia, Pa.
w Portable Elec. Co., Braintree, Mass.

Anchors.

Coleman, Walter & Sons, Providence, R. I.

Anti-Skid Devices.

Brown, J. O., Mfg. Co., Butler, Ind.
Crone, F. G., 152 Northampton Ave., Buffalo, N. Y.
Dentzeau, Geo., 161 Grand St., N. Y. City, N. Y.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Mesinger, H. & F. Mfg. Co., 1801 First Ave., N. Y. City, N. Y.
Sunbury Mfg. Co., Sunbury, Ohio.
Weed Chain Tire Grip Co., 28 Moore St., N. Y. City, N. Y.

Automobiles (Commercial).

Acme Motor Car Co., 8th and Elm Sts., Reading, Pa. (gasoline).
American Coulthard Co., 1001 Oliver Bldg., Boston, Mass. (steam).
Bartholomew Co. (The), 111-121 Fredonia Ave., Peoria, Ill. "Glide" (gasoline).
Buckeye Mfg. Co., Anderson, Ind., "Lambert" (gasoline).
Cadillac Motor Co., 1343 Cass Ave., Detroit, Mich., (gasoline).
Cantono Electric Tractor Co., 111 W. 37th St., N. Y. City (electric).
Chicago Commercial Auto. Mfg. Co., 1547 Marquette Bldg, Chicago, Ill. (gasoline).
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis. (gasoline).
Commercial Motor Car Co. (The), 4 East 42nd St., N. Y. City (gasoline).
The Commercial Motor Truck Co., Toledo, Ohio (gasoline).
Commercial Truck & Power Co., Rahway, N. J. (gasoline and steam).
Consoldidated Motor Co., 175 N. 9th St., Brooklyn, N. Y. (gasoline).
Corbin Motor Vehicle Corporation (The), New Britain, Conn. (gasoline).
The Couple-Gear Freight Wheel Co., Grand Rapids, Mich. (electric).
Deere-Clark Motor Car Co., East Moline, Ill. (gasoline).
Dorris Motor Car Co., 1211-15 N. Vandeventer Ave., St. Louis, Mo. (Gasoline.)
Duquesne Construction Co., Jamestown, N. Y. (gasoline).
Duryea Power Co., North River and Hockley Sts., Reading, Pa., "Duryea" (gasoline).
Elec. Vehicle Co. (The), Hartford, Conn. (gasoline and electric).
Four Wheel Drive Wagon Co., 3202-10 Vliet St., Milwaukee, Wis. (gasoline).
Grout Bros. Auto Co., Orange, Mass. (steam).
Halsey, J. T., 336 N. York Ave., Phila., Pa. (steam).
Hewitt Motor Co., 6-10 E. 31st St., N. Y. City (gasoline).
Iroquois Iron Works, 178 Walden Ave., Buffalo, N. Y. (gasoline).
Jeffery, Thos. B. & Co., Kenosha, Wis., "Rambler" (gasoline).
Johnson Service Co., Milwaukee, Wis. (steam).
Knox Automobile Co., Wilbraham Road, Springfield, Mass. (gasoline).
Knox Motor Truck Co., Becket St., Springfield, Mass. (gasoline).
Lansden Co. (The), 54 M. & E. R. R. Ave., Newark, N. J. (electric).
Logan Construction Co. (The), Chillicothe, Ohio, "Logan"

BUYERS' GUIDE—Continued

(gasoline).
McCrea Motor Truck Co. (The), American Trust Bldg., Cleveland, Ohio (electric).
Mack Bros. Motor Car Co., South Allentown, Pa. (gasoline.)
Marion Motor Car Co., West 15th St. & Big Four R. R., Indianapolis, Ind., "Marion" (gasoline)..
Matheson Motor Car Co., Wilkes-Barre, Pa. (Gasoline.)
Maxwell-Briscoe Motor Co., Tarrytown, N. Y. (Gasoline.)
Mercantile Motor Co. (The), Jersey City, N. J. gasoline and steam).
Mitchell Motor Car Co., Recine, Wis. (gasoline).
National Motor Vehicle Co., 22nd St. and L. E. & W. R. R., Indianapolis, Ind. (electric).
Olds Motor Works, Lansing, Mich., "Oldsmobile" (gasoline).
Packard Motor Car Co., Detroit, Mich., "Packard" (Gasoline).
Pittsburg Mach. Tool Co., Allegheny, Pa. (steam).
Pittsburg Motor Vehicle Co. (The), Ellsworth Ave. and Summerlea St., Pittsburg, Pa. (electric).
Pope Motor Car Co., Waverley Department, Indianapolis, Ind., "Pope-Waverley" (electric).
Rapid Motor Vehicle Co., Pontiac, Mich. (gasoline).
Reliance Motor Car Co., 23 Ford St., E. Detroit, Mich. "Reliance" (gasoline).
Reo Motor Car Co., Lansing, Mich., "Reo" (gasoline).
St. Louis Car Co., 8000 N. Broadway, St. Louis, Mo. (Gasoline and Electric Combined.)
St. Louis Motor Car Co., Peoria, Ill., "St. Louis" (gasoline).
Soules Motor Car Co., Grand Rapids, Mich. (gasoline).
Studebaker Automobile Co., South Bend, Ind. (gasoline and electric).
Synnestvedt Machine Co., 4117 Liberty Ave., Pittsburg, Pa. (electric).
Twyford Motorcar Co., Brookville, Pa. (gasoline).
Union Auto. Mfg. Co., St. Louis, Mo. (gasoline).
Vehicle Equipment Co., Borden Ave., Long Island City, N. Y. (electric and gasoline).
White Sewing Machine Co., 300 Rose Bldg., Cleveland, Ohio (steam).
Wolverine Auto. & Commercial Vehicle Co., Dundee, Mich., "Wolverine" (gasoline).
Woods Motor Vehicle Co., 110-120 E. 20th St., Chicago, Ill. (electric).

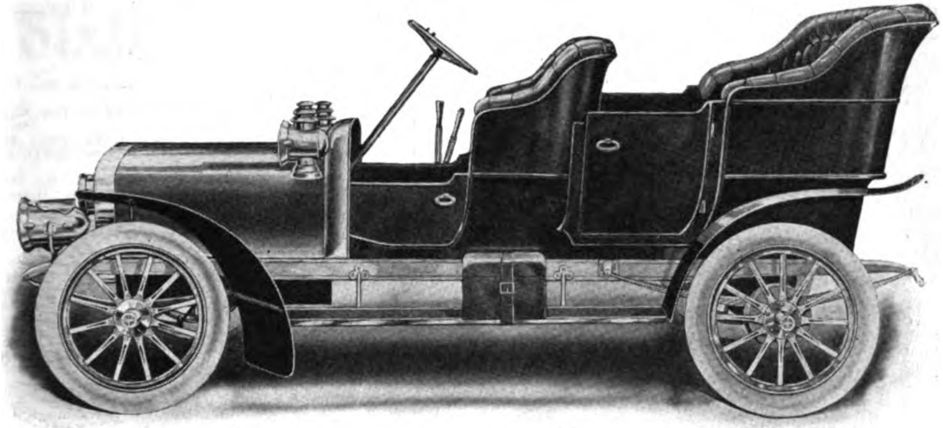
Automobiles (Electric).

Babcock Elec. Carriage Co., 240 W. Utica St., Buffalo, N. Y.
Baker Motor Vehicle Co., Cleveland, Ohio, "Baker."
Cantono Elec. Tractor Co., 111 W. 37th St., N. Y. City.
Columbus Buggy Co. (The), Columbus, Ohio.
Couple Gear Freight Wheel Co. (The), Grand Rapids, Mich.
Electric Vehicle Co. (The), Hartford, Conn. "Columbia."
Lansden Co. (The), 54 M. & E. R. R. Ave., Newark, N.J.
McCrea Motor Truck Co. (The), American Trust Bldg., Cleveland, Ohio.
National Motor Vehicle Co., 22nd St. and L. E. & W. R. R., Indianapolis, Ind. "National"
Pittsburg Motor Vehicle Co., Ellsworth Ave. and Summerlea St., Pittsburg, Pa.
Pope Motor Car Co., Waverley Department, Indianapolis, Ind., "Pope-Waverley."
Ranch & Lang Carriage Co. (The), 406 Superior St., Cleveland, Ohio.
Studebaker Automobile Co., South Bend, Ind., "Studebaker."
Synnestvedt Machine Co., 4117 Liberty Ave., Pittsburg, Pa.
Vehicle Equipment Co., Borden Ave., Long Island City, N. Y.
Woods Motor Vehicle Co., 110-120 E. 20th St., Chicago, Ill., "Woods."

Automobiles (Gasoline).

Acme Motor Car Co., 8th and Elm Sts., Reading, Pa., "Acme."
Adams Automobile Co., Hiawatha, Kansas, "Average Man's."
Adams Co. (The), Dubupue, Iowa, "Adams-Farwell."
Aerocar Co. (The), 59 McGraw Bldg., Detroit, Mich. "Aerocar."
American (The), Locomotive Auto Co., 111 Broadway, N. Y. City, "Berliet."
American Motor Car Mfg. Co., 910 State Life Bldg., Indianapolis, Ind.
Apperson Bros. Auto. Co., Kokomo, Ind., "Apperson."
Ardsley Motor Car Co., Yonkers, N. Y., "Ardsley."
Ariel Motor Car Co. (The), 70 Stanhope St., Boston, Mass., "Ariel."
Auburn Automobile Co., Auburn, Ind.
Austin Automobile Co., 86-92 S. Division St., Grand Rapids, Mich., "Austin."
Autocar Co. (The), Ardmore, Pa., "Autocar."
Bartholomew Co. (The), 111-121 Fredonia Ave., Peoria, Ill., "Glide."
Berkshire Automobile Co., Renne Ave., Pittsfield, Mass.
Beverly Mfg. Co., Beverly, Mass.
Blomstrom Motor Co., (The A. H.), 75 Clark Ave., Detroit, Mich., "Queen."
Brooks Motor Co., Michigan Ave., and M. C. R. R., Detroit, Mich.
Buckeye Mfg. Co., Anderson, Ind., "Lambert."
Buffum Co., (H. H.), Abingtgon, Mass.
Buick Motor Co., Jackson, Mich., "Buick."
Burtt Mfg. Co., 124-130 N. Edwards St., Kalamazoo, Mich.
Century Cash Register Co., Ltd., 656-672 Humboldt Ave.
Cadillac Motor Co., 1343 Cass Ave., Detroit, Mich., "Cadillac."
Detroit, Mich.
Chicago Commercial Auto. Mfg. Co., 1547 Marquette Bldg. Chicago, Ill.
Clemick-Hirsch Co., 504 National Ave., Milwaukee, Wis.
Cleveland Motor Car Co., 388-390 Erie St., Cleveland Ohio, "Cleveland."
Columbia Elec. Co., 23 E. Ohio St., Indianapolis, Ind.
Commercial Motor Car Co. (The), 4 East 42nd St., N. Y. City.
Commercial Motor Truck Co. (The), Toledo, Ohio.
Commercial Truck & Power Co., Rahway, N. J.
Consolidated Motor Co., 175 N. 9th St., Brooklyn, N. Y.
Corbin Motor Vehicle Corporation (The), New Britain Conn. "Corbin."
Corwin Mfg. Co., Peabody, Mass., "Gas-au-Lec."
Covert Motor Vehicle Co., Elwanger Barry Bldg., Rochester, N. Y., "Covert."
Crawford Auto. Co., Hagerstown, Md., "Crawford."
Crescent Auto. & Supply Co., 2254 Missouri Ave., St. Louis, Mo.
Croesus Motor Car Co., Kansas City, Mo.
Daimler Mfg. Co., 939 Steinway Ave., L. I. City, N. Y., "Daimler."
Dayton Motor Car Co., Dayton, Ohio, "Stoddard-Dayton."
Deere-Clark Motor Car Co., East Moline, Ill., "Deere."
Detroit Automobile Mfg. Co. (The), 259 Willis Ave., E Detroit, Mich.
Detroit Auto.-Vehicle Co., 65-71 Catherine St., Detroit, Mich., "Crown."
Detroit-Oxford Mfg. Co. (The), Oxford, Mich.
Dolson Automobile Co., Charlotte, Mich., "Dolson."
Dorris Motor Car Co., 1211-15 N. Vandeventer Ave., St. Louis, Mo.
Duquesne Construction Co., Jamestown, N. Y. "Duquense."
Duryea Power Co., North River and Hockley Sts., Reading, Pa., "Duryea."
E. H. V. Co. (The), Middletown, Conn., "Compound."
Eagle Automobile Co., 92 Hamilton St., Rahway, N. J.
Easton Machine Co., 24 Milk St., Boston, Mass.
Electric Vehicle Co. (The), Hartford, Conn., "Columbia."
Elmore Mfg. Co., 1004 Amanda St., Clyde, Ohio, "Elmore."
Essex Motor Car Co., 60 State St., Boston, Mass.
Fairmount Engineering Co., 3207 Spring Garden St., Phila., Pa., "Chadwick."
Ford Motor Co., Piquette and Beaubien Sts., Detroit, Mich., "Ford."
Forest City Motor Car Co., Massilon, Ohio.
Four Wheel Drive Wagon Co., 3302-10 Vliet St., Milwaukee, Wis.
Franklin, H. H. Mfg. Co., Auto. Dept., 402 S. Geddes St., Syracuse, N. Y., "Franklin."
Gaeth Auto. Works, 902-6 Pearl St., Cleveland, Ohio "Gaethmobile."
Grout Bros. Automobile Co., Orange, Mass., "Grout."
Harris, E. T., 531-545 W. 15th St., Chicago, Ill.
Haynes Automobile Co., Kokomo, Ind., "Haynes."
Hewitt Motor Co., 6-10 E. 31st St., New York, N. Y.
Hill Motor Car Co., Haverhill, Mass.
Holsman Auto. Co., 622 Monadnock Bldg., Chicago, Ill. "Holsman."
Iroquois Iron Works, 178 Walden Ave., Buffalo, N. Y.
Iroquois Motor Car Co., Seneca Falls, N. Y., "Iroquois."
Jackson Automobile Co., Jackson, Mich., "Jaxon."
Jeffery, Thos. B. & Co., Kenosha, Wis., "Rambler."
Jones-Corbin Motor Co., 31st and Ludlow Sts., Phila. Pa., "Jones-Corbin."
Kansas City Motor Car Co., Kansas City, Mo.
Knox Auto. Co., Wilbraham Road, Springfield, Mass. "Knox."
Knox Motor Truck Co., Becket St., Springfield, Mass. "Atlas."
Krueger Mfg. Co., 463-465 Front St., Milwaukee, Wis.
La Salle-Niagara Auto. Co., La Salle, N. Y., "Niagara."
Leader Auto. Co. (The), 2442 Lisbon Ave., Milwaukee Wis.
Lear, Oscar Auto. Co., 4th and Gay Sts., Columbus, Ohio "Frayer-Miller."
Lebanon Motor Co., Lebanon, Pa.
Lehr Agricultural Co. (The), Jackson St., Fremont, Ohio
Locomobile Co. of America, Bridgeport, Conn., "Locomobile."
Logan Construction Co. (The), Chillicothe, Ohio "Logan."
Lozier Motor Co., 55th St. and Broadway, N. Y. City, N. Y., "Lozier."
Mack Bros. Motor Car Co., South Allentown, Pa.
Mahoning Motor Car Co. (The), Youngstown, Ohio.
Marion Motor Car Co., West 15th St. and Big Four R. R., Indianapolis, Ind., "Marion."
Matheson Motor Car Co., Wilkes-Barre, Pa., "Matheson."
Maxwell-Briscoe Motor Co., Tarrytown, N. Y., "Maxwell."
Mercantile Motor Co. (The), Jersey City, N. J.
Merkel Motor Co., Layton Park, Milwaukee, Wis.
Michigan Auto. Co., Ltd., Kalamazoo, Mich.
Mitchell Motor Car Co., Racine, Wis., "Mitchell."
Model Gas Engine Wks., 175 Wabash Ave., Auburn, Ind. "Model."
Moline Automobile Co., East Moline, Ill., "Moline."
Moon Motor Car Co., Main and Cornelius Sts., St. Louis, Mo., "Hercules."
Moore Automobile Co., 571 Fifth Ave., N. Y. City, N. Y.
Motor Car Co. (The), 230 21st St., Detroit, Mich.
Napier Motor Co., of America, 743 Boylston St., Boston, Mass., "American Napier."
National Motor Vehicle Co., 22nd St. and L. E. & W. R. R., Indianapolis, Ind., "National."

Aerocar



The Car for to-day—to-morrow and years to come.
Built by Practical Men.

THE **Aerocar** comes as the fulfillment of all that has been proven best in the air-cooled motor car. It represents the efforts from years of constant experimenting, testing and proving—a motor car of enduring serviceability—superior in mechanical design and construction, and carrying all the luxury and beauty in modern motor car equipment.

It is the only air-cooled motor car which overcomes all obstacles and objections in practical test.

The motor is the very soul of an automobile, and while the **Aerocar** is ideal in the graceful lines of body, in its roomy luxuriousness and elegance of equipment, it is in the air-cooled motor that its distinguishing superiority lies. Its motor is of wonderful efficiency—it is the crowning result of ten years constant effort along most practical investigation, studying and experimenting with all the adopted methods and designs of air-cooled motors, selecting the best of each, improving and adding to, until we have for the **Aerocar** an air-cooled motor which may rightly be called perfect in operation and for satisfactory results—always ready, night or day, in the hottest of mid-summer or the coldest zero of mid-winter, to meet every reasonable demand.

THE AEROCAR, 1906. 22-26 h.p. Four cylinders. Five passengers. 45 miles an hour. 104-inch wheel base. Shaft drive. Sliding gear transmission. Three speeds and reverse. Perfect disc clutch. Hollow steel dash. Four sight lubricators on dash. Tool box on running board. 34 x 4 tires. 9-inch road clearance. Weight, 2000 pounds. Fully equipped, ready for the road, including two large gas headlights, **$2800 f. o. b. Detroit.**

Ready and anxious to demonstrate any time or all times.

Deliveries. Ready to deliver cars February.

Will be exhibited and demonstrated at the Automobile Shows in New York and Chicago.

The dealer who has the selling agency of the **Aerocar** will have a gold mine. Territory being rapidly taken up. If interested write us promptly.

THE AEROCAR CO., Detroit, Michigan

BUYERS' GUIDE—Continued

GASOLINE AUTOMOBILES—continued

National Sewing Machine Co., Belvidere, Ill., "Eldridge."
New Way Motor Co. (The), Lansing, Mich., "Clarksmobile."
Nordyke & Marmon Co., Auto. Dept., Indianapolis, Ind. **"Marmon."**
Northern Mfg. Co., Champlain St. and Canton Ave., Detroit, Mich., **"Northern."**
Olds Mobile Wks., Lansing, Mich., "Oldsmobile."
Packard Motor Car Co., Detroit, Mich., "Packard."
Peerless Motor Car Co. (The), Quincy and Oakdale Sts., Cleveland, Ohio, "Peerless."
Pierce, Geo. N. Co. (The), 752-758 Main St., Buffalo, N. Y. **"Pierce Arrow."**
Pierce Engine Co., Racine Junction, Wis., "Pierce-Racine."
Pokorney, H. Automobile & Gas Engine Co., 1704 Bellefontaine St., Indianapolis, Ind.
Pope Manufacturing Co., Hagerstown, Md. "Pope-Tribune."
Pope Mfg. Co., Hartford, Conn., "Pope-Hartford."
Pope Motor Car Co., Toledo, Ohio., "Pope-Toledo."
Practical Automobile Co. (The), 446-447 Mercantile Block, Aurora, Ill.
Premier Motor Mfg. Co., George and Shelby Sts., Indianapolis, Ind., "Premier."
Pungs-Finch Auto. & Gas Engine Co., Detroit, Mich., "Pungs-Finch."
Rainier Co. (The), 50th St. and Broadway, N. Y. City, N. Y., "Rainier."
Rapid Motor Vehicle Co., Pontiac, Mich., "Rapid."
Reliance Motor Car Co., 23 Fort St., E. Detroit, Mich., "Reliance."
Reo Motor Car Co., Lansing, Mich., "Reo."
Royal Motor Car Co., Marquette and Lake Sts., Cleveland, Ohio, "Royal Tourist."
St. Louis Car Co., 8000 N. Broadway, St. Louis, Mo.
St. Louis Motor Car Co., Peoria, Ill., "St. Louis."
Schacht Mfg. Co., 2727 Spring Grove Ave., Cincinnati, Ohio.
Shawmut Motor Co., Boston, Mass.
Simplex Motor Car Co., Mishawaka, Ind. "Simplex."
Single Center Buggy Co., Evansville, Ind.
Smith & Mabley, Inc., Broadway bet. 56th and 57th Sts., N. Y. City, "S. & M."
Sommer Motor Co., Box 138, Detroit, Mich.
Soules Motor Car Co., Grand Rapids, Mich., "Soules."
Stearns, F. B. Co. (The), Euclid and Lakeview Aves., Cleveland, Ohio, "Stearns."
Sterling Engine Co., 121 Grant St., Buffalo, N. Y.
Stevens, J., Arms & Tool Co., 700 Main St., Chicopee Falls, Mass. "Stevens-Duryea."
Studebaker Automobile Co., South Bend, Ind., "Studebaker."
Sturtevant Mill Co. (The), Harrison Sq., Boston, Mass.
Thomas, E. R. Motor Co., 1418 Niagara St., Buffalo, N. Y., "Thomas."
Tincher Motor Car Co., Jackson and Robey Sts., Chicago, Ill.
Torbensen Motor Car Co., Bloomfield, N. J.
Trumbull Mfg. Co., Warren, Ohio.
Twyford Motorcar Co., Brookville, Pa.
Union Automobile Mfg. Co., St. Louis, Mo. "Union."
Vehicle Equipment Co., Borden Ave., Lond Island City, N. Y.
Walker Motor Car Co., 109 Fort St., East, Detroit, Mich.
Waltham Mfg. Co., Waltham, Mass. "Waltham Orient."
Warren Automobile Co. (The), Warren, Pa.
Wayne Automobile Co., 119-129 Champlain St., Detroit, Mich., "Wayne."
Wayne Wks., Richmond, Ind.
Welch Motor Car Co., Detroit, Mich. "Welch."
Western Motor Truck and Vehicle Co., 27 S. Clinton St., Chicago, Ill.
Western Tool Wks. (The), Galesburg, Ill. "Gale."
Windsor Automobile Co., Evansville, Ind.
Winton Motor Carriage Co., Berea Road, Cleveland, Ohio. "Winton."
Wolverine Auto. and Commercial Vehicle Co. (The), Dundee, Mich. "Wolverine."
Woods Motor Vehicle Co., 110-120 E. 20th St., Chicago, Ill. "Woods."
York Automobile Co., York City, Pa. "York."
Zent Automobile Mfg. Co., Bellefontaine, Ohio. "Zent."

Automobiles (Steam).

American Coulthard Co., 1001 Oliver Bldg., Boston, Mass.
Boss Knitting Mach. Works, cor. Elm and Reed Sts., Reading, Pa. "Boss."
Century Auto-Power Co., East Orange, N. J. (to order).
Clark, Edward S., 272-278 Freeport St., Boston, Mass.
Commercial Truck and Power Co., Rahway, N. J.
Grout Bros. Automobile Co., Orange, Mass.
Halsey, James T., 336 N. York Ave., Phila., Pa.
Johnson Service Co., Milwaukee, Wis.
Lane Motor Vehicle Co., Poughkeepsie, N. Y.
Mercantile Motor Co. (The), Jersey City, N. J.
Pittsburg Mach. Tool Co. (The), Allegheny, Pa.
Ross, Louis S., Newtonville, Mass.
Stanley Motor Carriage Co., Newton, Mass. "Stanley."
Thompson Automobile Co., Providence, R. I.
White Sewing Machine Co., 300 Rose Bldg., Cleveland, Ohio. "White."

Automobile Covers.

Armbruster, R. H., 309 S. 6th St., Springfield, Ills.
Automobile Cover and Top Mfg. Co., 148 W. 56th St., New York City.
Duane, W. J. & Co., 1771 Broadway, New
Empire Gear and Top Co., 413 N. 22nd St.,
Excelsior Supply Co., 233-237 Randolph St.,
Gilbert Mfg. Co., New Haven, Conn.
National India Rubber Co., Bristol, R. I.
Springfield Auto Top and Upholstering Co., St., Springfield, Mass.
Vehicle Apron and Hood Co., 198 E. Rich Ohio.
Wiley (The), Wm. H. Co., Box 78 Hartford,

Automobile Garages.

Auto. Maintenance Co., Broad and Ellsworth delphia, Pa.
East Liberty Auto. Co., 5969 Centre Ave.,
Henry, Chester C., Summit, N. J.

Automobile Parts.

American Machine and Mfg. Co., 972 Hamilto land, Ohio. (to order.)
Auto. and Power Appliance Co. (The), 357-359 Cleveland, Ohio.
Detroit Screw Wks., Detroit, Mich. (Cups, axles, bearings, gear blanks, turnbuckles, —to order).
Eclipse Mfg. Co., 45 Fort St., Detroit, Mich
Homer Brass Wks., 231 Race St., Phila., order.)
Kokomo Brass Wks., Kokomo, Ind. (to
Leader Automobile Co., 2442 Lisbon Ave.,
Muncie Auto. Parts Co., Muncie, Ind.
National Cycle Mfg. Co., Bay City, Mich.
Neustadt Auto. and Supply Co., 826 S. 18th Mo.
Parish & Bingham Co., Hamilton St. E. of land, Ohio.
Smith & Mabley Co., Inc., Broadway be. Sts., New York City.
Spacke, F. W. Machine Co. (The), Madison and Penn Sts., Indianapolis, Ind.
Standard Welding Co., 35 Cone St., Cleveland vers and axle housings.)
Walker & Ehrman Mfg. Co., 129-133 W. Chicago, Ill.

Automobile Specialties (Mis eous).

American Battery Co., No. 172 S. Clinton Ill. (Lighting batteries.)
Arlington Co., 475 Broadway, New York City ent pyralin sheets.)
The Auto Improvement Co., 304 Hudson St. City. (Detector to prevent use of car.) "
Central Automobile Supply Co., 111 Meigs B port, Conn. (Auto garment rack.)
Chicago Battery Co., Michigan Ave. and 14th go, Ill. (Electric lights for enclosed cars.)
The Constant Co., 188 Columbus St., Boston, itive clutch for White cars.)
Duplex Folding Pail Co., 114 E. 14th St., New (Folding wash basins.)
Excelsior Supply Co., 233-235 Randolph St.,
Gilbert Mfg. Co., New Haven, Conn. (Steer boots.)
Janney, Steinmetz & Co., 4th and Market St phia, Pa. ("Hill" lock valve.)
H. W. Johns-Manville Co., 100 Williams St., City. (Asbestos firefelt coverings.)
Locke Regulator Co., Salem, Mass. (Tank fi
Nathan Novelty Mfg. Co., 88-90 Reade St., New (Cardan and steering joint protectors.)
Pope Motor Car Co., Waverley Department, Ind. (Electric automobile sundries.)
Poughkeepsie Suit Case Co., Poughkeepsie, N tool box.)
Rice, John V., Jr., & Co., Bordentown, N. J
Teel, E. & Co., Medford, Mass. (Trunk racks,

Axles (Automobile).

American Ball Bearing Co., Seward St. and S. Ry., Cleveland, Ohio.
American Die and Tool Co., Reading, Pa.
American Roller Bearing Co., So. Framingham,
Bearing Co. (The), Bradford, Pa.
Borbein, H. F. & Co., 2109 N. 9th St., St. Lo
Case Mfg. Co. (The), Columbus, Ohio.
Columbus Auto Axle Mfg. Co., 870 S. 3rd St., Ohio.
Columbus Screw and Machine Co. (The), 244 Columbus, Ohio.
Cramp, The Wm. & Sons' S. and E. B. Co., Ball Sts., Philadelphia, Pa.
Dalzell Axle Co., So. Egremont, Mass.
Evans, Coppins & Starks Co., Princeton, Ill.
Garford Co. (The), Elyria, Ohio.
Gill, P. H. & Sons Forge and Machine Wks and Otsego Sts., Brooklyn, N. Y.
Hyatt Roller Bearing Co., Harrison, N. J.
Lee Mfg. Co. (The), South Park, Port Hu (on contract.)
Lee & Porter Mfg. Co., Buchanan, Mich.
Light Mfg. and Foundry Co., Union and Pottstown, Pa.

Madison Square Garden

JANUARY 13th TO 20th, 1906, INCLUSIVE

Sixth National Automobile Show

Given Under the Auspices of The Association of Licensed Automobile Manufacturers

The most complete line of American and Imported Cars and of Parts and Accessories ever exhibited. Madison Square Garden has never before been so beautifully and artistically decorated.

GASOLINE AVTOMOBILES

(AMERICAN)

Apperson	Apperson Bros. Automobile Co.
Autocar	Autocar Co.
Buick	Buick Motor Co.
Cadillac	Cadillac Motor Car Co.
Columbia	Electric Vehicle Co.
Elmore	Elmore Mfg. Co.
Franklin	H. H. Franklin Mfg. Co.
Haynes	Haynes Auto. Co.
Hewitt	Hewitt Motor Co.
Kirk	Kirk Mfg. Co.
Knox	Knox Auto. Co.
Locomobile	Locomobile Co, of America.
Matheson	Matheson Motor Car Co.
Northern	Northern Mfg. Co.
Oldsmobile	Olds Motor Works.
Packard	Packard Motor Car Co.
Peerless	Peerless Motor Car Co.
Pierce-Arrow	Geo. N. Pierce Co.
Pope-Hartford	Pope Mfg. Co.
Pope-Tribune	
Pope-Toledo	Pope Motor Car Co.
Royal-Tourist	Royal Motor Car Co.
S.-M. Simplex	Smith & Mabley Inc.
Stearns	F. B. Stearns Co.
Stevens-Duryea	J. Stevens Arms & Tool Co.
Studebaker	Studebaker Automobile Co,
Thomas Flyer	E. R. Thomas Motor Co.
Walter Car	Walter Auto. Co.
Waltham-Orient	Waltham Mfg. Co.
Winton	Winton Motor Carriage Co.

(IMPORTED)

Clement-Bayard	Sidney B. Bowman Auto Co.
Darracq	American Darracq Auto Co.
C. G. & V.	Decauville Automobile Co.
Daimler (English)	
Decauville	
De Detrich	De Detrich Importing Co.
F. I. A. T.	Hollander & Tangeman.
Mercedes	Smith & Mabley Inc.
Panhard	
Renault	
Rochet-Schneider	Auto Import Co.

ELECTRIC AVTOMOBILES

Buffalo	Babcock Elect. Carriage Co.
Cantano	Cantano Electric Tractor Co.
Columbia	Electric Vehicle Co.
Columbus	Columbus Buggy Co.
Gallia	Gallia Electric Carriage Co.
Pope-Waverly	Pope Mfg. Co.
Studebaker	Studebaker Automobile Co.
Vehicle Equipment	Vehicle Equipment Co.

COMMERCIAL AUTOMOBILES

Columbia	Electric Vehicle Co.
Hewitt	Hewitt Motor Co.
Knox	Knox Auto. Co.
Oldsmobile	Olds Motor Works.
Pope-Waverly	Pope Mfg. Co.
Studebaker	Studebaker Automobile Co.
Vehicle Equipment	Vehicle Equipment Co.

All Gasoline Automobiles exhibited at the Garden are licensed under Geo. B. Selden V. S. patent No. 549,160

BUYERS' GUIDE—Continued

Milwaukee Motor Co., 615 Clybourne St., Milwaukee, Wis.
Moffet Vehicle Bearing Co., 922 S. Niagara St., Saginaw, W. S., Mich.
Muncie Wheel and Jobbing Co., Muncie, Ind.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Rogers, The Geo. D., Automobile Parts Mfg. Co., 56 Kinsman St., Cleveland, Ohio.
Salisbury Wheel and Mfg. Co., Jamestown, N. Y.
Shelby Steel Tube Co., Frick Bldg., Pittsburg, Pa. (Tubes.)
Standard Roller Bearing Co., 49th St. and Girard Ave., Philadelphia, Pa.
Steel Ball Co. (The), 832 Austin St., Chicago, Ill.
Timken Roller Bearing Axle Co., Canton, Ohio.
Weston-Mott Co., Utica, N. Y.

Axles (Cycle).

Corbin Screw Corporation, New Britain, Conn.
Harris, E. T., 531-545 W. 15th St., Chicago, Ill.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.

Axle Tubes.

Detriot Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich.

Balls.

American Ball Co., Eagle St., and Kinsley Ave., Providence, R. I. (Steel, brass and bell metal.)
Jones, E. J. & Co., Arlington Heights, Mass. (Forged steel.)
Standard Roller Bearing Co., 49th and Girard Ave., Phila., Pa. (Steel.)
Steel Ball Co., 832 Austin Ave., Chicago, Ill. (Steel.)

Ball Bearings (Automobile).

American Ball Bearing Co., Seward St. and L. S. & M. S. Ry., Cleveland, Ohio.
American Ball Co., Eagle St. and Kinsley Ave., Providence, R. I.
Auburn Ball Bearing Co., 29-35 Elizabeth St., Rochester, N. Y. (thrust).
Bantam Anti-Friction Co., Bantam, Conn.
Clark Ball Bearing Co. (The), Bradford, Pa.
Corbin Screw Corporation, New Britain, Conn. (Cones.)
Hess-Bright Mfg. Co. (The), 245-247 N. Broad St., Philadelphia, Pa.
Pressed Steel Mfg. Co., 545 The Bourse, Philadelphia, Pa. "Knipe."
Smith Co., A. O., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Standard Roller Bearing Co., 49th St. and Girard Ave., Philadelphia, Pa.
Worcester Pressed Steel Co., Worcester, Mass.

Ball Bearings (Cycle).

Corbin Screw Corporation, New Britain, Conn. (Cones.)
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. (Stamped cups and cones.)
Harris, E. T., 531-45 W. 15th St., Chicago, Ill. (Adj. cones and cups.)
Nelson, A., Mfg. Co., 67-69 S. Canal St., Chicago, Ill. (Nelson's Adj. Cones.)
Pressed Steel Mfg. Co., 545 "The Bourse," Phila., Pa.
Sartus Ball Bearing Co., 155 Spring St., New York City. (Sartus ball retainers.)
Star Ball Retainer Co. (The), Lancaster, Pa. (Ball retainer.)
Stevens & Co., 99 Chandler St., New York City. (Cones.)
Worcester Pressed Steel Co., Worcester, Mass.

Baskets.

Burlington Basket Mfg. Co., Burlington, Iowa. (Refrigerator.)
Hall, E. L., 239 E. 27th St., New York City. ("M. & A.")
Heywood Bros. & Wakefield Co., 174 Portland St., Boston, Mass.

Battery and Coil Cases.

American Coil Co., Foxboro, Mass.
Coop, C. W. & Co., 3 Appleton St., Boston, Mass.
Hutchinson Electric Horn Co., Suite 9033 No. 1 Madison Ave., New York, N. Y.
West, F. W., Box Co., Springfield, Mass.

Battery Connections.

B. & B. Co. (The), Plainfield, N. J. "Bulldog."
Bliss-Chester Co., 31 Mathewson St., Providence, R. I.
Eastern Carbon Works, West Side Ave. and Central R. R., Jersey City, N. J.
International Brass & Electric Co., 76 Beekman St., New York City.

Judd & Leland Mfg. Co., Clifton Springs, N.
Never-Miss Spark Plug Co., Lansing, Mich.
Peerless Machine Company, 124 Miami Ave., De
Shain, Chas. D., 70 Murray St., New York Ci

Bearings (Automobile)

Auto Brass and Aluminum Co., Flint, Mic and Bronze.)
Blake, Edwin J., Hartford, Conn. (Bearing m
Clark, A. N. & Son, Plainville, Conn. (Bea
Clum & Atkinson, Rochester, N. Y. (Babbit
Cramp, The Wm. & Sons' S. E. B., Beach an Philadelphia, Pa. (Bearing metal.)
Hardy, Wm. A. & Sons Co., Fitchburg, Ma metal.)
Light Mfg. & Foundry Co., Union and Queen town, Pa. (Ball cups and cones and Bear
Mayo Damper Co., 355 Walnut St., Pottstown, ing metal.)
Midvale Steel Co. (The), Nicetown, Philadelp
Reeves, Paul S. & Son, 1415 Catherine St., Pa. (Babbitt metal.)
Syracuse Raw Hide Co., 506-510 S. Clinton St N. Y. (Raw hide.)
Victor Metals Co. (The), E. Braintree, Ma bronze and anti-friction metal.)

Bells (Automobile).

Liberty Bell Co., Bristol, Conn. "Liberty" &
Mossberg, Frank Co., Attleboro, Mass.
Post & Lester Co. (The), 20 Sargeant St., Har
Rousseau Mfg. Co., 310 Mott Ave., N. Y. City.

Bells (Cycle).

Liberty Bell Co., Bristol, Conn. ("Liberty" ard.")
Mossberg, Frank, Co., Attleboro, Mass.
New Departure Mfg. Co. (The), Bristol, C Departure," "Bristol" and "Incomparable."
Nock, Geo. W., 126 N. 4th St., Phila., Pa. "

Belt Dressing.

Buffalo Specialty Co., 375 Elicott St., Buffalo,
Miller's, Wm. P. Sons, 100 Greenpoint Ave. N. Y. ("F. & O.")
New York and New Jersey Lubricant Co., St., New York City. (For motor cycles.)
White & Bagley Co., Worcester, Mass. ("Ne

Belts (Motor Cycle).

Chicago Raw Hide Mfg. Co. (The), 75-77 Oh cago, Ill.
Geer, Harry R. Co., 1017 Pine St., St. Louis,
Merkel Motor Co. (The), Layton Park, Milwa
Rahmann, Geo. & Co., 6 Ferry St., New York

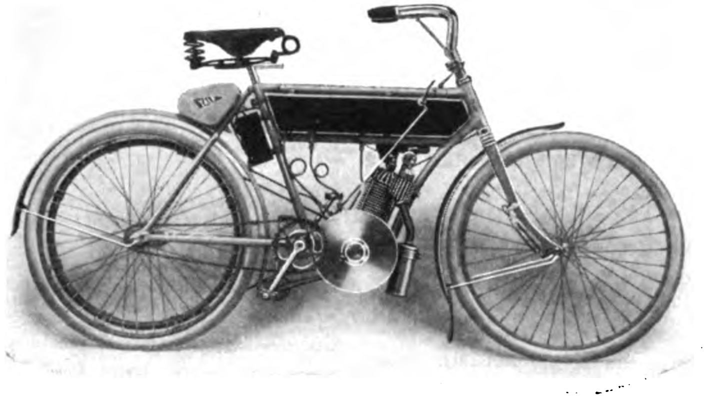
Bent Wood Work.

American Veneer Co., 100 Market St., Kenilw
Coops, C. W. Co., 3 Appleton St., Boston, M
Dann Bros. & Co. (The), 80-86 Franklin St., Conn.
Shepard, H. G. & Sons, James and River St ven, Conn.
Shiels, Charles F., & Co., Cincinnati, Ohio.
Tucker Wood Work Co., Sidney, Ohio.

Bicycles.

Consolidated Mfg. Co., Toledo, Ohio. "Yale "Ensign," "King," "Buffalo" and "Queen
Excelsior Supply Co., 233-237 Randolph St., C
Fowler-Manson-Sherman Cycle Mfg. Co., 45-47 Chicago, Ill. "Fowler-Manson & Sherman."
Goddard & Allen Co. (The), Rockford, Ill. "
Great Western Mfg. Co., La Porte, Ind. "Cr lake," "American" and "Mitchell."
Hendee Mfg. Co., 216 Worthington St., Spring "Indian."
Iver-Johnson Arms and Cycle Wks., Fitch "Iver-Johnson."
Light Mfg. and Foundry Co., Union and Pottstown, Pa.
Meadowbrook Cycle Co., 137-141 Jackson St., L. I., N. Y.
Miami Cycle and Mfg. Co., Grand Ave., Ohio. "Racycle."
National Cycle Mfg. Co., 300 Lord St., Bay "National."
National Sewing Mach. Co., Belvidere, Ill. "
Pierce, The Geo. N. Co., 752-758 Main St., Bu
Pope Mfg. Co., Hartford, Conn.
The Progressive Mfg. Co., Torrington, Conn.
Reading Standard Cycle Mfg. Co., Reading "Standard."
Toledo Metal Wheel Co., Toledo, Ohio.

THE 1906 YALE-CALIFORNIA



This is a new model of the

YALE=CALIFORNIA.

Its design and finish are superior to anything heretofore attempted in the motorcycle line. It is universally conceded to be one of the most beautiful, graceful, and mechanically perfect motorcycles on the market, and is **the one which runs all the time.**

Wherever it was found possible to make the slightest improvement, we spared no expense to accomplish the result, and the refinement in detail and construction makes it one of the strongest, lightest (100 pounds all on), most powerful and economical motorcycle in the world.

Dealers will find it absolutely the best proposition they have ever had in this line. Write early for territorial allotment. Agencies are being closed rapidly.

CONSOLIDATED MFG. CO.,
TOLEDO, OHIO.

BUYERS' GUIDE—Continued

Bicycles (Chainless).

Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Pierce, The Geo. N. Co., 752-758 Main St., Buffalo, N. Y.
Pope Mfg. Co., Hartford, Conn.

Bicycles (Juvenile).

Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Pope Mfg. Co., Hartford, Conn. "Fay."
Toledo Metal Wheel Co., Toledo, Ohio. "Favorite" and "Cupid."

Bicycle Parts (Miscellaneous).

Corbin Screw Corporation, New Britain, Conn.
Harris, E. T., 531-545 W. 15th St., Chicago, Ill. Sprocket band.)

Bicycle Sundries (Miscellaneous).

Bowen Mfg. Co., Canal St., Auburn, N. Y. (Felt strips.)
Coey, C. A. & Co., 1424-1426 Michigan Ave., Chicago, Ill. (Bicycle railway attachment.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Harris, E. T., 531-545 W. 15th St., Chicago, Ill. (Bicycle railway attachment.)
India Rubber Co., 16 Warren St., New York City. (Frame buffers.)
Worcester Pressed Steel Co., Worcester, Mass. (Pressed steel.)
Judd & Leland Mfg. Co., Clifton Springs, N. Y. (Rim washers, cotter pins.)
Ossawan Mills Co., Norwich, Conn. (Valve wire.)
Stevens & Co., 99 Chambers St., New York City. (Nickel plated screws and washers.)

Bilge Pumps.

Curtiss Co., 67 Gold St., New York City, N. Y.
Lobee Pump and Machinery Co., 140-152 Terrace, Buffalo, N. Y.
National Mfg. Co. (The), Worcester, Mass. "Johnson."
Sands, A. B. & Sons, 242 Water St., N. Y. City, N. Y.

Binding Posts.

Bown Machine Co., Ltd., 92 Jefferson Ave., South, Battle Creek, Mich.
Fahnestock Electric Co. (The), 132 Havemeyer St., Brooklyn, N. Y. (Spring.)
International Brass & Electric Co., 76 Beekman St., New York City.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.
Sittman & Pitt, State St., & Boerum Pl., Brooklyn, N. Y.
United Electrical Mfg. Co., 53 Vesey St., N. Y. City.

Boat Covers.

Hemmenway, S. & Son, 54 South St., N. Y. City.

Boat Lighting Outfits.

Chicago Battery Co., Michigan Ave., and 14th St., Chicago, Ill.
Richardson Engineering Co., 36 Pearl St., Hartford, Conn.

Bodies.

American Veneer Co., 100 Market St., Kenilworth, N. J.
Auto Body Co. (The), Lansing, Mich.
Automobile Cover and Top Mfg. Co., 148 W. 56th St., New York, N. Y.
Auto. Top and Specialty Co., Broadway and 63rd St., New York City.
Barndt-Johnston Auto. Supply Co. (The), Columbus, O.
Biddle & Smart Co., Amesbury, Mass.
Beihl's Carriage and Wagon Works, Reading, Pa. (to order.)
Borbein, H. F. & Co., 2109 N. 9th St., St. Louis, Mo.
Briggs Carriage Co., Amesbury, Mass.
Broc (The) Carriage and Wagon Co., 417-421 Case Ave., Cleveland, Ohio.
Buckeye Carriage Body Co., Bellefontaine, Ohio.
Buffalo Auto. Body and Trimming Co., 338-340 Ellicott St., Buffalo, N. Y.
Carlisle Body and Gear Co., Carlisle, Pa.
Cartier-Chapman & Co., Ludington, Mich.
Central Mfg. Co., Connersville, Ind.
Chisholm—Phillips Automobilium Co. (The), 1322-1324 Euclid Ave., Cleveland, Ohio.
Currier-Cameron Co. (The), 85 Elm St., Amesbury, Mass.
Dann Bros. & Co. (The), 80-86 Franklin St., New Haven, Conn.
Demarest, A. T. & Co., 335 5th Ave., N. Y. City.
Detroit Carriage Co., Detroit, Mich.
Detroit Motor Car Supply Co., 1256 Jefferson Ave., Detroit, Mich.
Everitt, B. F., 63-65 Fort St., East, Detroit,
Ford Mfg. Co., Kalamazoo, Mich.
Frantz Body Mfg. Co., Akron, Ohio.
Halliday, C. A., 42 Cedar St., Oneida, N. Y.
Hayes Mfg. Co. (The), 825-45 Maybury Gran troit, Mich.
Healy & Co., 51st St. and Broadway, N. Y.
Heinlein, George, Columbus, Ohio.
Heywood Bros. & Wakefield Co., 174 Portland Mass.
Hill (The) Mfg. Co., 1394-96 West Ave., Buffal
Holcomb, H. C., 105 Goffe St., New Haven,
Hollander, Lambert, Amesbury, Mass
Hookerre, Henry, New Haven, Conn.
Howarth & Rogers Co., Oak St., Amesbury,
Hyslop Body Co. (The), Cleveland, Ohio.
Jackson Body Co., Jackson, Mich.
Kimball, C. P. & Co., 315-317 Michigan Ave.,
Lane, Thos. W., Chestnut St., Amesbury, Ma
La Porte Carriage Co., La Porte, Ind.
Lawrence, L. & Co., 292 Halsey St., New (Aluminum.)
Limousine and Carriage Mfg. Co., 323-325 Chicago, Ill.
Locke & Co., 318-320 W. 84th St., N. Y. City.
Mack Bros. Motor Car Co.. South Allentown,
Michigan Auto. Body Co., 1425-41 Gratiot Av Mich.
Michigan (The) Steel Boat Co., Detroit, Mich
Middletown Auto. Body Co., Durham Rd., Conn.
Moore & Munger Co., 602 W. 52nd St., N. Y
Neustadt Auto. and Supply Co., 826-30 S. 1 Louis, Mo.
New Haven Carriage Co., Water and Franklin Haven, Conn.
New York Automobile Exchange, 154 E. 57th York City.
Ohio Carriage Co., Bellefontaine, Ohio.
Pontiac Body Co., Pontiac, Mich.
Quinby, J. M. & Co., 1534 Broadway, New minum.)
Reading Metal Body Co., Fleetwood, Pa.
Rogers, Wm. D., Son & Co., Broad St., Phi
Schildwachter Carriage Co., 128th St. and New York City.
Schubert Bros. Gear Co., Oneida, N. Y.
Seabrook & Smith Carriage Co., 130 Park St., Conn.
Springfield Metal Body Co., Brightwood, Spring (Aluminum and steel.)
Stewart, W. F. Co., Flint, Mich.
Union City Body Co., 302½ Oak St., Union
United States Aluminum Co. (The) New Kens (Aluminum.)
Wayman & Murphy, Randolph and Sangamon cago, Ill.
Willoughby Co., 86 Genesee St., Utica, N. Y.
Wilson, C. R., Body Co., Detroit, Mich.

Boilers.

Boss Knitting Mach. Wks., cor. Reed and Reading, Pa.
Century Auto-Power Co., East Orange, N. J.
Clark, Edward S., 272-278 Freeport St., Boston
Forg, Peter, 50 Park St., Somerville, Mass.
Grout Bros. Automobile Co., Orange, N. J.
Locke Regulator Co., Salem, Mass.
Neustadt Auto. and Supply Co., 826-830 S. 1 Louis, Mo.
Ofeldt, August & Sons, 331 W. 44th St., N. Y.
Ofeldt, F. W. & Son, Nyack, N. Y.
Portland Garage, Portland, Me. "Stickney."
Steam Carriage Boiler Co., 119 First St., Oswe
Tonkin Boiler Co., Oswego, N. Y. "Tonkin."
Walker, E. C. Co., 1913-1923 Logan St., Loui (Flash.)

Boiler Shell and Tubes.

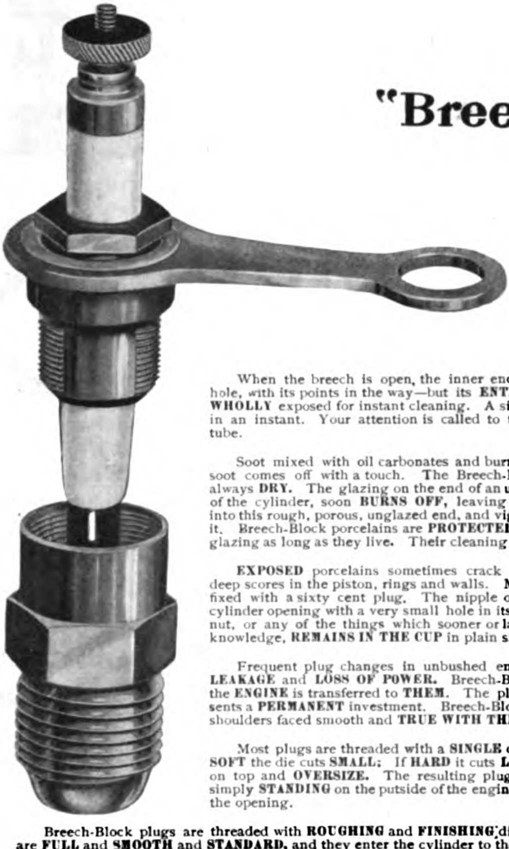
Century Auto-Power Co., East Orange, N. J.
Columbus Brass Co., 43 N. 4th St., Columbus,
Detroit Seamless Steel Tubes Co., 804 Union T Detroit, Mich.
Janney, Steinmetz & Co., 4th and Market Sts.,
Shelby Steel Tube Co., Frick Bldg., Pittsburg,
Tonkin Boiler Co., Oswego, N. Y.

Bows.

Brown, S. N. & Co., Dayton, Ohio.
Union Bow Co. (The), 190 Superior St., Clevelan

Bow Sockets.

Beecher, Walter N., Michigan Ave and 35th St. Ill. (Sliding.)
Coops, C. W. Co., 3 Appleton St., Boston, Mass.
Cortland Forging Co., Cortland, N. Y. (Steel.)
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mi
Roehm & Davison, Ltd., Detroit, Mich.



The "Breech-Block" Plug

Four "*Breech-Block*" *plugs can be opened, cleaned and closed in* **sixteen** *seconds by the watch.*

When the breech is open, the inner end of the porcelain—not its tip looking out of a hole, with its points in the way—but its **ENTIRE INNER SURFACE** for over **ONE** inch is **WHOLLY** exposed for instant cleaning. A single twist with a piece of waste makes it white in an instant. Your attention is called to the **INCH.** The inch is on the **OUTSIDE** of the tube.

Soot mixed with oil carbonates and burns into the glaze and is hard to remove. **DRY** soot comes off with a touch. The Breech-Block chamber excludes all oil. Its tube is always **DRY.** The glazing on the end of an unprotected tube, exposed to the intense heat of the cylinder, soon **BURNS OFF,** leaving the porous core **EXPOSED.** Soot and oil burn into this rough, porous, unglazed end, and vigorous cleaning can only **PARTIALLY** remove it. Breech-Block porcelains are **PROTECTED** from the intense heat. They **RETAIN** their glazing as long as they live. Their cleaning is fun.

EXPOSED porcelains sometimes crack off and drop down into the cylinder, cutting deep scores in the piston, rings and walls. More than one sixty dollar cylinder has been fixed with a sixty cent plug. The nipple of the Breech-Block forms a **CUP** down in the cylinder opening with a very small hole in its base. A broken tube tip, a washer, a thumb nut, or any of the things which sooner or later drop into the cylinder with or without your knowledge, **REMAINS IN THE CUP** in plain sight. Removal is easy.

Frequent plug changes in unbushed engine openings cause **WEAR** on the threads, **LEAKAGE** and **LOSS OF POWER.** Breech-Block nipples become **FIXTURES.** All wear on the **ENGINE** is transferred to **THEM.** The plug is made to outwear the engine and represents a **PERMANENT** investment. Breech-Block Metrics have **LARGE, GENEROUS** packing shoulders faced smooth and **TRUE WITH THE THREADS.**

Most plugs are threaded with a **SINGLE** die in a single operation. If the bar of steel is **SOFT** the die cuts **SMALL;** If **HARD** it cuts **LARGE** and the threads are **ROUGH** and **FLAT** on top and **OVERSIZE.** The resulting plugs barely enter their openings and appear to be simply **STANDING** on the putside of the engine with their sparking tips at the **MOUTH** of the opening.

Breech-Block plugs are threaded with **ROUGHING** and **FINISHING** dies in **TWO** separate operations, Their threads are **FULL** and **SMOOTH** and **STANDARD,** and they enter the cylinder to the **PROPER DEPTH**—every one of them. They are made from **SELECTED** stock. Hard bars are used for other purposes without loss to the maker. Breech-Block porcelains are held **FLOATING** between flexible gaskets. They are touched by no unyielding metal walls. **BOTH** stuffing nut threads are heavily nickeled and cannot lock with rust even after long disuse. They are always free, and upon loosening them the tubes **DROP** out and the gaskets **DROP** with them. No digging and driving, and a replacement requires less than a minute.

Porcelains from every available high grade porcelain manufacturer have been tried out. Some have been sterling, others uncertain. The porcelain in the 1906 Breech-Block is the result of **ELIMINATION.** Exhaustive tests have proven the chambered plug to have firing qualities superior to the open end bent wire type, but a full stock of the latter is carried for the benefit of those who do not appreciate the advantages of the former. Upon replacing an ordinary set of plugs with Breech-Blocks it is necessary to **RETARD** the spark to prevent an increase in engine speed. This is easily proven food-thought for those who consider all good plugs as having the same firing values.

A drop of gasoline placed in the chamber of the Breech-Block and the spark passed will cause a strong explosion within and the **STREAM** of fire which **SHOOTS** out of the opening will ignite a gas jet some distance away. This effect might not be so pronounced if there were **OTHER** large openings in the chamber walls. This test gives some idea of the igniting power of the stream of fire which shoots deep down into the mixture at each explosion. On engines which throw the slightest amount of oil on the tubes of the ordinary open plug, the oil collects into a **SOOTY DROP** between the sparking tips after the engine has been at rest, which can only be broken by removing the plug or agitating the contents of the cylinder by **VIGOROUS CRANKING.**

With a Breech-Block, the **SLIGHTEST** movement of the piston causes a transfer of gas through the spark gap opening into the chamber, instantly breaking any film of oil which may have collected there. Porcelains having their electrodes **CEMENTED** within them must be entirely replaced when broken. Breech-Block porcelains have easily **REMOVABLE** electrodes, which last indefinitely, and porcelains **ONLY** need replacing. The joint between the Breech and Block is made on a thick, solid, soft copper gasket, pressed tightly in place in a recess and seat ground in place. It is seated at 45 degrees, and will stand 2000 pounds without showing a leak. It is the standard hydraulic press connection, fitted with a breech-block.

The Breech-Block plug is sold at a price which permits its maker to employ skilled mechanics in its manufacture, to put the best of everything which is possible to buy into it, and to turn out an interchangeable product with refinements which have never been known before to plug making. Every particle of the idea of cheapness has been left out of it. It has been listed in the 1906 catalogs of nearly every jobber in America, without soliciting. Standard, Metric and Winton plugs are carried in regular stock. Bushings can be furnished to fit any engine to order. Metric to Standard, Standard to Knox, and Standard to Autocar, are kept in stock.

"**FOUR** *Breech-Blocks can be opened, cleaned and closed in* **SIXTEEN** *seconds by the watch*"

Seven patents pending in
U. S. and Europe.

Postpaid,
$2.50

EARL CANEDY,
2002 West Avenue, Chicago Heights,
U. S. A.

NO EXCUSE

FOR

AUTOMOBILE ACCIDENTS!

The Raymond Brake FITS ANY AUTOMOBILE CONSTRUCTION AND HOLDS TILL THE WHEELS SLIDE

ROYAL EQUIPMENT CO.,
151 Housatonic Ave., Bridgeport, Connecticut.

BUYERS' GUIDE—Continued

Brakes (Automobile).

Auto Supply Co., Inc., 1662 Broadway, N. Y. City.
Columbus Screw & Machine Co. (The), 244 Kaiser St., Columbus, Ohio.
Gas Engine Whistle Co., 1133 B'dway, New York. (Power.)
Hatcher Auto. Parts Co. (The), 138 Viaduct, Cleveland, O.
Muncie Auto. Parts Co., Muncie, Ind.
Muncie Wheel and Jobbing Co., Muncie, Ind.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Royal Equipment Co., 151 Housatonic Ave., Bridgeport, Conn. "Raymond."
Steel Ball Co., 832 Austin Ave., Chicago, Ill.
Youse, E. S., 46 N. 5th St., Reading, Pa. (Sprag.)

Brakes (Cycle).

Corbin Screw Corporation, New Britain, Conn.
Duck Brake Co., 335 Broadway, N. Y. City. ("Duck" Roller, also for motor cycles.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. ("Forsyth detachable.)

Brake Bands, Etc.

Neustadt Auto Supply Co., 826-30 S. 18th St., St. Louis, Mo. (Brakedrums.)
The Rossindale-Reddaway Belting and Hose Co., Newark, N. J. (Camelhair brake banding.)
Smith, A. O. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis. (Bands and Levers.)

Brass and Bronze Castings.

Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
Allyne Brass Foundry Co., Cleveland, Ohio.
Amesbury Brass and Foundry Co., Amesbury, Mass.
Auto Brass and Aluminum Co., Flint, Mich.
Bethlehem Steel Co., 100 Broadway, N. Y. City.
Blake, Edwin J., Hartford, Conn.
Bridgeport Deoxidized Bronze and Metal Co., 429 Iranistan Ave., Bridgeport, Conn.
Cassin, John E., Hanover, N. H.
City Brass Foundry Co., Cleveland, Ohio.
Clark, A. N. & Son, Plainville, Conn. (to order.)
Clum & Atkinson, Rochester, N. Y.
Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y.
Columbus Brass Co., 43 N. 4th St., Columbus, Ohio.
Cramp, The Wm. & Sons' S. and E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
Crescent Mfg. Co., Scottdale, Pa.
Diamond Stamped Ware Co., Summitt Ave., Detroit, Mich.
Eagle Brass Works, Franklin and Du Bois Sts., Detroit, Mich.
Enterprise Foundry Co., Detroit, Mich.
Gerson-Carey Co., Lansing, Mich.
Graham, Jas. & Co., New Haven, Conn.
Hofeller Brass Foundry Co., 98-108 Terrace, Buffalo, N. Y.
Hofeller-Brooks Aluminum and Brass Co., Fort St., E., Detroit, Mich.
Homer Brass Works, 231 Race St., Philadelphia, Pa.
Imperial Brass Mfg. Co. (The), 245-247 S. Jefferson St., Chicago, Ill.
Kalamazoo Novelty Co., Kalamazoo, Mich.
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Lunkenheimer Co. (The), Cincinnati, Ohio.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Mack Bros. Motor Car Co., South Allentown, Pa.
Mayo Damper Co., 365 Walnut St., Pottstown, Pa.
Midland Metal Co., Inc., 1427-33 Catherine St., Phila., Pa.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
National Car Wheel Co., Pittsburg, Pa.
Nolte Brass Co., Springfield, Ohio.
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Norwalk Brass Co., Norwalk, Conn.
Phosphor Bronze Smelting Co. (The), 2200 Washington Ave., Philadelphia, Pa.
Pioneer Brass Works, 418-424 S. Penna. St., Indianapolis, Ind.
Providence Aluminum Co., 460 Eddy St., Providence, R. I.
Racine Boat Mfg. Co., Muskegon, Mich.
Racine Brass and Iron Co., Racine, Wis.
Reeves, Paul S. & Son, 1415 Catherine St., Phila., Pa.
Sherwood Brass Works, 1167-1169 Jefferson Ave., Detroit, Mich.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Smith, Geo. D., Jr., Baldwins, L. I., N. Y.
Standard Brass Foundry Co., 1196-1200 Central Ave., Cleveland, Ohio.
Standard Foundry Co., Hartford, Conn.
Syracuse Aluminum and Bronze Co. (The), Syracuse, N. Y.
Trumbull Mfg. Co., Warren, Ohio.
U. S. Aluminum Casting Co., Vandalia Ave., Cincinnati, Ohio.
Victor Metals Co. (The), East Braintree, Mass.
Western Motor Co., Logansport, Ind.
Wilcox, Crittenden & Co., Middletown, Conn.

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Three through Pullman trains daily from

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BUYERS' GUIDE—Continued

Brazing Compounds.

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill. (For cast iron and steel.)
American Ferrofix Brazing Co. (The), 813-a Arcade Bldg., Philadelphia, Pa.
Dixon, Jos. Crucible Co., Jersey City, N. J. (Brazing graphite.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. "High Pressure" and "Red Cross."
Standard Brazing Co., 88 Broadway St., Boston, Mass.
Thompson, Chas. A. Co., 39 Cortland St., N. Y. City. (Self-fluxing solder.) "Solderine."
U. S. Brazing Compound Co., 113-115 S. 2nd St., New Bedford, Mass.

Brazing Forges.

National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. "High Pressure" and "Red Cross."
Turner Brass Works (The), Franklin and Michigan Sts., Chicago, Ill.

Buffets, Portable.

Portable Buffet Co., 145 E. 42nd St., N. Y. City.

Burners for Steam Autos.

Boss Knitting Mach. Wks., cor. Elm and Reed Sts., Reading, Pa. (Kerosene.)
Century Auto-Power Co., East Orange, N. J. (Kerosene.)
Clark, Edw. S., 272-278 Freeport St., Boston, Mass.
Forg, Peter, 50 Park St., Somerville, Mass.
Grout Bros. Automobile Co., Orange, Mass.
Kelly Handle Bar Co., 385 Perkins Ave., Cleveland, Ohio. "Kelly."
Locke Regulator Co., Salem, Mass.
National Oil Heating Co., Melrose, Mass. (Kerosene, "Melrose.")
Ofeldt, F. W. & Son, Nyack, N. Y. (Kerosene.)
Steam Carriage Boiler Co., 119 First St., Oswego, N. Y. (Kerosene and gasoline.)
Tonkin Boiler Co., Oswego, N. Y. (Kerosene.)
Walker, E. C. Co., 1913-1923 Logan St., Louisville, Ky. (Kerosene and gasoline.) "Lightning."

Burners for Boat Boilers.

Walker, E. C. Co., 1913-1923 Logan St., Louisville, Ky.

Burner Parts.

Boss Knitting Machine Wks., Elm and Reed Sts., Reading, Pa. (Generator.)
Forg, Peter, 50 Park St., Somerville, Mass. (Generator.)
Grout Bros. Automobile Co., Orange, Mass. (Generator.)
Kelly Handle Bar Co., 385 Perkins Avenue, Cleveland, Ohio. (Generator and Torch combined.)
Locke Regulator Co., Salem, Mass. (Generator.)

Canopies (Boat).

Harlow Canopy Co., Janesville, Wis. (Awnings.)
Hemmenway, S. & Son, 54 South St., N. Y. City. (Awnings and side curtains.)
Morton, Robert E., 26 South St., N. Y. City, N. Y. (Spray hoods and awnings.)
Jones & Robinson, 83 Front St., N. Y. City, N. Y. (Spray hoods.)
McClellan, Chas. T., Fall River, Mass. (Spray hoods.)
Truscott Boat Mfg. Co., St. Joseph, Mich.

Caps (Auto).

Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Kibbe & Tomlinson, Batavia, N. Y.
Morawetz Co. (The), 343 Broadway, Milwaukee, Wis.
Pontiac Knitting Co., Pontiac, Mich.
Post & Lester Co. (The), Hartford, Conn.
Saks & Co., Broadway, 33rd and 34th Sts., N. Y. City.
Scandinavian Fur and Leather Co., 14-16 W. 33rd St., New York City.
Shaw, Ora D., 109 Kingston St., Boston, Mass.
Springfield Hat and Cap Co., Springfield, Mass.

Carbide.

Acetylene Gas Illuminating Co., 105 Walker St., New York City. (Crude and refined.)

Carburetors.

Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
American Coil Co., Foxboro, Mass. (Mixing Valve.)
American Generator Co., N. E. Cor. Park Ave. and 63rd St. (Combined tank and carburetors.)
Ardsley Motor Car Co., Yonkers, N. Y.
Auto. Brass & Aluminum Co., Flint, Mich.
Automobile Supply Co. (The), 1339 Michigan Ave., Chicago, Ill.
Auto. & Power Appliance Co. (The), 357-359 The Arcade, Cleveland, Ohio.
Barker, C. L., Norwalk, Conn. "Barker."
Bowen Motor Co., 92 Baynes St., Buffalo, N. Y. "Phoenix."
Bradford Motor Co., Bradford, Pa. "Longuemare."
Breeze Motor Mfg. Co., 33 Court St., Newark, N. J.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y. "Brennan."
Burtt Mfg. Co., 124-130 N. Edwards St., Kalamazoo, Mich.
Byrne, Kingston & Co., Kokomo, Ind. "Kingston."
Camden Anchor-Rockland Machine Co., Rockland, Me. "Knox."
Chaney, A., Mfg. Co., Terre Haute, Ind.
Ciemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw & Mach Co. (The), 244 Kaiser St., Columbus, Ohio.
Continental Engine Co., Cor. Kinsbury and Huron Sts., Chicago, Ill.
Continental Motor Mfg. Co., 240-244 W. Lake St., Chicago, Ill.
Cook Kerosene Carburetor Co., 15-21 Exchange Place, Jersey City, N. J. "Cook Kerosene."
Crouch, Chas. P., & Co., 472-484 Carroll Ave., Chicago, Ill.
Crouch Motor Co., Stoneham, Mass. "Crouch."
Culver Novelty Co. (The), Culver, Ind.
Curtiss, Geo. H., Mfg. Co., Hammondsport, N. Y.
Dearborn, F. W., 751 Old South Bldg., Boston, Mass.
Dow Portable Electric Co., Braintree, Mass. "Methot."
Duryea Power Co., N. River and Hockley Sts., Reading, Pa. (Atomizer.)
Essex, G. B. Brass Co., 480 Franklin St., Detroit, Mich.
Fairmount Engineering Co., 3207 Spring Garden St., Phila., Pa.
Fast Machine and Tool Works, 1061-1063 29th Ave., Milwaukee, Wis.
Fouch, J. R., 35 Chute Block, Minneapolis, Minn.
Funke, A. H., 83 Chambers St., N. Y. City, N. Y. (Motor Cycle).
Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo. (Motor Cycle.)
Generator Valve Co., 108 Liberty St., N. Y. City, N. Y. (Marine.)
Hatcher Auto-Parts Co. (The), 138 Viaduct, Cleveland, O.
Hewitt Motor Co., 6-10 E. 31st St., N. Y. City, N. Y.
Holley Bros. Co., 661-673 Beaubien St., Detroit, Mich. "Holley."
Hub Motor Co. (The), 34 Beach St., Boston, Mass. (Generator Valve.)
Hurd & Haggin, 316 Hudson St., N. Y. City, N. Y.
Imperial Brass Mfg. Co. (The), 245-247 S. Jefferson St., Chicago, Ill.
Jager, Chas. J., Co., 166-68 High St., Boston, Mass.
Knoblock-Heideman Mfg. Co. (The), South Bend, Ind.
Lake View Automobile Co., 1049 Sheffield Ave., Chicago, Ill.
Lee Mfg. Co. (The), South Park, Port Huron, Mich. (On Contract.)
Lipman, Carl E. L., Beloit, Wis.
Little & Eastman Co., 595 Harrison Ave., Boston, Mass. "Menn's."
Loomis Auto Car Co., Westfield, Mass. (Auto. & Marine.)
Lunkenheimer Co. (The), Cincinnati, Ohio. (Generator valve.)
Lustre Chemical Co., 1303 Michigan Ave., Chicago, Ill. "Gavelek."
Massnick Mfg. Co., 671 Atwater St., Detroit, Mich.
Maxwell & Fitch Co. (The), Rome, N. Y.
Mayo Damper Co., 395 Walnut St., Pottstown, Pa.
Merkel Motor Co., Layton Park, Milwaukee, Wis.
Michigan Motor Co., 246 S. Front St., Grand Rapids, Mich.
Milwaukee Motor Co., 615 Clybourn St., Milwaukee, Wis.
Minn. Boat & Power Works, Stillwater, Minn. "Schmidt."
Motor & Mfg. Works Co. (The), 107-113 N. Albany St., Ithaca, N. Y.
Murray, John A., 112 Front St., Brooklyn, N. Y.
Muncie Auto. Parts Co., Muncie, Ind.
North Chicago Machine Co., North Chicago, Ill.
Pioneer Brass Works, 418-24 S. Pennsylvania St., Indianapolis, Ind. (To Order.)
Pokorney Automobile & Gas Engine Co., 1704 Bellefontaine St., Indianapolis, Ind.
Rice, John V., Jr., & Co., Bordentown, N. J.
Saris, Joseph H., Beloit, Wis.
Seitz, F. A., & Co., 390 Webster Ave., L. I. City, N. Y.
Shain, Chas. D., 70 Murray St., N. Y. City, N. Y.
Sherman, F. W., [illegible]27 Willow Ave., W. Somerville, Mass.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Shipman Mfg. Co., Sunbury, Pa. "Shipman."
Speed Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind.
Turner Brass Works (The), Franklin and Michigan Sts., Chicago, Ill.
Tuttle, D. M., Canastota, N. Y.
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul, Minn.
Walker, B. F., 57 Golden Hill St., Bridgeport, Conn.
Weeber, C. T., Mfg. Works, 255 Sherman St., Albany, N. Y.
Wheeler, F. H., 937 N. Meridian St., Indianapolis, Ind. "Schebler."
Winkley Co. (The), Box 243, Detroit, Mich. "Garllus."
Wray Pump and Register Co., 191 Mill St., Rochester, N. Y.

Carburetor Floats.

Goodwin & Kintz Co., Winsted, Conn.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Worcester Pressed Steel Co., Worcester, Mass.

Your Gasoline Tank Afire!

What would you think of it?

You'd run: but you would not run if it was one of our tanks, because you would know you were in no danger

ALWAYS REMEMBER THESE FACTS

The tank cannot leak.

It makes no difference how many holes get torn in it.

The tank cannot possibly explode.

Because there is no leak to carry fire to it.

The tank increases your engine power greatly.

Because it furnishes constantly a large supply of perfectly dry gas ready to receive the air and become an explosive mixture.

The tank reduces consumption of gasoline nearly one-half.

Because there is no waste and because every drop of gasoline is converted into power.

The tank does away with your carburetor.

And therefore you have none of the troubles of the carburetor, with its needle valves sticking and its float refusing to work right. No adjustments to make. No worry. Just go ahead.

ABSOLUTE SAFETY **INCREASED POWER**

Decreased consumption of fuel
No carburetor troubles
Reduced insurance premiums

Write to us for further particulars

American Generator Co.

N. E. Cor. Park Ave. and 63d Street, New York City

BUYERS' GUIDE—Continued

Carrier Cycles.

Michigan Automobile Co., Ltd., Kalamazoo, Mich.

Castings.

Acme Foundry Co., Isabella Ave., near Michigan Ave., Detroit, Mich.
Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
Acme Steel and Malleable Iron Works, 245 Military Road, Buffalo, N. Y.
Adrian Steel Castings Co., Adrian, Mich.
Allyne Brass Foundry Co., Cleveland, Ohio.
Aluminum Foundry Co., Manitowoc, Wis.
Amesbury Brass and Foundry Co., Amesbury, Mass.
Arcade Malleable Iron Co., Worcester, Mass.
Auto Brass and Aluminum Co., Flint, Mich.
Barcus, Geo., & Co., Wabash, Ind.
Belle City Mfg. Co., Box D., Racine Junction, Wis.
Bethlehem Steel Co., 100 Broadway, N. Y. City.
Blake, Edwin J., Hartford, Conn.
Bridgeport Deoxidized Bronze and Metal Co., 429 Iranistan Ave., Bridgeport, Conn.
Brown & Sharpe Mfg. Co., Providence, R. I.
Buhl Malleable Co., Wight and Adair Sts., Detroit, Mich.
Burtt Mfg. Co., 124-140 N. Edward St., Kalamazoo, Mich. (Tank Lugs.)
The Canton Malleable Iron Co., Canton, Ohio.
The Capitol Foundry Co., Hartford, Conn.
Cassin, John E., Hanover, N. H.
Chrome Steel Works, Chrome, N. J.
City Brass Foundry Co., Cleveland, Ohio.
Clark, A. N., & Son, Plainville, Conn.
Clum & Atkinson, Rochester, N. Y.
Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y.
Columbus Brass Co., 43 N. 4th St., Columbus, Ohio.
Columbus Screw and Machine Co. (The), 244 Kaiser St., Columbus, Ohio.
Cramp, Wm., & Sons (The), S. & E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
Crescent Mfg. Co., Scottdale, Pa.
Crucible Steel Castings Co., 612 Clinton St., Milwaukee, Wis.
Diamond Stamped Ware Co., Summitt Ave., Detroit, Mich.
Eagle Brass Works, Franklin and Dubois Sts., Detroit, Mich.
Ellis, F. L., & Son, Milldale, Conn.
Enterprise Foundry Co., Detroit, Mich.
Essex Engineering Co., 54 Nassau St., Newark, N. J.
Evinrude, O., 128 Ferry St., Milwaukee, Wis.
Felix Mfg. Co., 2 Auburn Ave., Buffalo, N. Y.
Fulton Foundry and Machine Co., 21 Furman St., Brooklyn, N. Y.
Geer, Harry R. Co., 1017 Pine St., St. Louis, Mo.
Gerson-Carey Co., Lansing, Mich.
Goodnow, L. H., Foundry Co., Fitchburg, Mass.
Graham, Jas., & Co., New Haven, Conn.
Hardy, Wm. A., & Sons Co., Fitchburg, Mass.
Harrison, H. K., 378-380 E. 7th St., St. Paul, Minn. (Motor Cycle.)
Hart, Wm. R., 12 Allen St., Lawrence, Mass.
Hofeller Brass Foundry Co., 98-108 Terrace, Buffalo, N. Y.
Hofeller-Brooks Aluminum and Brass Co., Fort St., E., Detroit, Mich.
Hoffman Hinge and Foundry Co., Cleveland, Ohio.
Homer Brass Works, 231 Race St., Philadelphia, Pa.
Hopson & Chapin Mfg. Co., New London, Conn.
Houle, A. J., 580 East St., Holyoke, Mass.
The Imperial Brass Mfg. Co., 245-247 S. Jefferson St., Chicago, Ill.
Interstate Foundry Co., Sheridan St., and C. P. R. R., Cleveland, Ohio.
Janney, Steinmetz, & Co., 4th and Market Sts., Philadelphia, Pa.
Johnson, Isaac G., & Co., Spuyten Duyvil, N. Y. City.
Kalamazoo Novelty Co., Kalamazoo, Mich.
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Lozier Motor Co., 55th St. and Broadway, New York City.
The Lunkenheimer Co., Cincinnati, Ohio.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Mack Bros. Motor Car Co., South Allentown, Pa.
The Manufacturers' Foundry Co., Waterbury, Conn.
Massachusetts Steel Casting Co., West Everett, Mass.
Mayo Damper Co., 355 Walnut St., Pottstown, Pa.
Midland Metal Co., Inc., 1427-33 Catharine St., Philadelphia, Pa.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Milwaukee Steel Foundry Co., Milwaukee, Wis.
National Car Wheel Co., Pittsburg, Pa.
The Naugatuck Malleable Iron Co., Naugatuck, Conn.
Neustadt Auto and Suppy Co., 826-30 S. 18th St., St. Louis, Mo.
New Jersey Steel Co., Rahway, N. J.
Nolte Brass Co., Springfield, Ohio.
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Norwalk Brass Co., Norwalk, Conn.
Palmers & De Mooy Foundry Co., Cleveland, Ohio.
Perkins, Henry, Co., Bridgewater, Mass.
Phoenix Automobile Supply Co., 3939 Olive St., St. Louis, Mo. (Engine.)
The Phosphor Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa.
Pioneer Brass Works, 418-424 S. Penna. St., Indianapolis, Ind.
The Pittsburg Reduction Co., Pittsburg, Pa.
Port Huron Engine and Thresher Co., Port Huron, Mich.
Providence Aluminum Co., 460 Eddy St., Providence, R. I.
Racine Boat Mfg. Co., Muskegon, Mich.
Racine Brass and Iron Co., Racine, Wis.
Reeves, Paul S., & Son, 1415 Catharine St., Philadelphia, Pa.
Sherwood Brass Works, 1167-69 Jefferson Ave., Detroit, Mich.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Smith, Geo. D., Jr., Baldwins, L. I., N. Y.
Smith, Geo. H., Steel Casting Co., Clinton St., Greenfield Ave. and Barclay St., Milwaukee, Wis.
Spencer, I. H., & Co., 10 S. Ewing Ave., St. Louis, Mo.
Standard Brass Foundry Co., 1196-1200 Central St., Cleveland, Ohio.
Standard Foundry Co., Hartford, Conn.
Stowell Mfg. and Foundry Co., S. Milwaukee, Wis.
The Syracuse Aluminum and Bronze Co., Syracuse, N. Y.
Trumbull Mfg. Co., Warren, Ohio.
U. S. Aluminum Casting Co., Vandalia Ave., Cincinnati, Ohio.
U. S. Aluminum Co., New Kensington, Pa.
U. S. Foundry and Sales Co., Norwalk, Conn.
Veeder Mfg. Co., Sargeant and Garden Sts., Hartford, Conn. (Fine brass.)
The Victor Metals Co., East Braintree, Mass.
Western Malleable and Gray Iron Castings Co., Milwaukee, Wis.
Western Malleable Steel Co., Detroit, Mich.
Western Motor Co., Logansport, Ind.
Whiteley Steel Co., Muncie, Ind. ("McHaffie" and "Crown.")
D. E. Whiton Machine Co., New London, Conn. (Fly Wheels.)
F. B. Widmayer, 2312 Broadway, New York City. (Cycle Motor.)
Wilcox, Crittenden & Co., Middletown, Conn.

Cements.

Diamond Rubber Co., Akron, Ohio. "Titan."
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill.
Fisk Rubber Co., Chicopee Falls, Mass. (Auto and bi.)
Goodrich, B. F., & Co., "Goodrich," Akron, Ohio.
Hartford Rubber Works Co., Hartford, Conn. "Hartford."
Hastings & Anderson, 116 Lake St., Chicago, Ill.
India Rubber Co., 16 Warren St., N. Y. City.
International Automobile and Vehicle Tire Co., Milltown, N. J.
M. & M. Mfg. Co., Akron, Ohio. (And acid curing solutions.)
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. "Red Cross," "Anchor," "Pioneer," High Pressure, "A. & B."
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Pneu-Cure Co., 1133 Broadway, N. Y. City. "Pneu-Cure."
The Rath Mfg. Co., 1023-5 N. 3d St., Philadelphia, Pa.
Rubber Goods Repair Co., 89 16th St., Chicago, Ill.
Chas. O. Tingley & Co., Rahway, N. J.
Young, Orlando W., 174-180 Frelinghusen Ave., Newark, N. J.

Chains (Automobile).

Baldwin Chain and Mfg. Co., Dept. B, 31 Hermon St., Worcester, Mass. ("Baldwin" Detachable.)
Boston Gear Works, 152 Purchase St., Boston, Mass.
Diamond Chain and Mfg. Co., 241 W. Georgia St., Indianapolis, Ind.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Link Belt Engineering Co., Hunting Park Ave. and P. & R. R. R., Nicetown, Philadelphia, Pa.
Meisel Press and Mfg. Co., 944-948 Dorchester Ave., Boston, Mass.
Morse Chain Co., Trumansburg, N. Y. (Silent Running High Speed.)
Whitney Mfg. Co. (The), Hartford, Conn.

Chains (Cycle).

Baldwin Chain and Mfg. Co., Dept. B, 31 Hermon St., Worcester, Mass. ("Baldwin" Detachable.)
Diamond Chain Mfg. Co., 241 W. Georgia St., Indianapolis, Ind.
Duckworth Chain and Mfg. Co., 41 Mill St., Springfield, Mass. "Duckworth."
Morse Chain Co., Trumansburg, N. Y. (Morse Twin Roller.)
Whitney Mfg. Co. (The), Hartford, Conn. ("Wizard.")

Chain Adjusters.

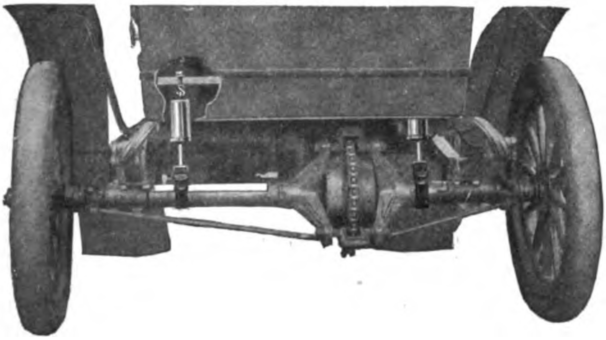
Aurora Automatic Machinery Co., Aurora, Ill. "Thor."
Clark, A. N., & Son, Plainville, Conn.
Corbin Screw Corporation, New Britain, Conn.
Worcester Pressed Steel Co., Worcester, Mass.

Chain Cleaners (Cycle).

National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. (Brush.)
Noonan Tool and Machine Works, 103-105 W. Dominick St., Rome, N. Y.

A Spring Recoil Check

An automatic, frictional device perfectly controlling the recoil of the Springs



Its attachment to the body and axle of the car is easily made and so arranged that it is flexible, so that any oscillating or lateral movement of the car or running gear cannot strain or break its parts, and no oiling or adjusting is required.

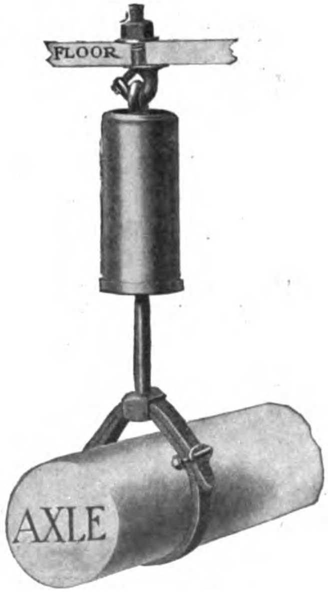
A Protection Against Broken Springs

Prevents the quick recoil over rough places which lifts the rider from the seat and makes travel fatiguing.

Permits the free action of the springs over smooth roads, but steadies the movement of the car over rough places and to a large degree relieves the weight from the tires when striking severe obstructions in the road.

Makes fast riding, with comfort and safety, possible.

For fuller description send for Circular. Dept. B



Baldwin Chain & Mfg. Co.

Worcester, Mass.

Show Space, 69th Regiment Armory, No. 25
Madison Square, No. 63.
Coliseum, Chicago, No. 187.

BUYERS' GUIDE—Continued

Chain Cleaning Materials.

Cole, G. W., Co., 143 Broadway, N. Y. City. ("3-in-1.")
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill. ("Famous.")

Chain Guards (Automobile).

Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.

Chain Guards (Cycle).

American Wood Rim Co., Onaway, Mich.
Clark, A. N., & Son, Plainville, Conn.
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. ("Forsyth" Metal.)

Chain Guard Attachments (Cycle).

Clark, A. N., & Son, Plainville, Conn.
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y.

Charging Apparatus.

Bruce-Meriam-Abbott Co., Columbus St., Cleveland, Ohio.
Elbridge Electrical Mfg. Co., Elbridge, N. Y. (Automatic Storage Battery Switches.)
Elwell-Parker Elec. Co. of Amer., Hamilton, Case Ave. and Belden Sts., Cleveland, Ohio. (Current Alternator.)
General Elec. Co., 84 State St., Boston, Mass. (Mercury Arc, Rectifier, Switches, Rheostats, Wires and Cables.)
Hewitt-Cooper Electric Co., 220 W. 29th St., N. Y. City. (Converter.)
Holtzer-Cabot Elec. Co., Brookline, Boston, Mass.
Hutchison Elec. Horn Co., Suite No. 9033, 1 Madison Ave., N. Y. City.
Marine Engine and Mach. Co., 126 Liberty St., N. Y. City. ("Secor.")
Mietz, Aug., 125 Mott St., N. Y. City. (Kerosene Eng. and Dynamos.)
Northern Electrical Mfg. Co., Madison, Wis.
Phillips Motor Works, 133 La Salle St., Chicago, Ill.
Richardson Eng. Co., 36 Pearl St., Hartford, Conn.
Wagner Elec. Mfg. Co., 2017 Locust St., St. Louis, Mo.
Westinghouse Elec. and Mfg. Co., Pittsburg, Pa.
Witherbee Igniter Co., 541 W. 43d St., N. Y. City.

Chassis, Complete.

Aster Co., 1591 Broadway, N. Y. City.
Couple Gear Freight Wheel Co., The, Grand Rapids, Mich.
Garford Co., The, Elyria, Ohio.
Mack Bros. Motor Car Co., South Allentown, Pa.
Speed Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind.
Torbensen Motor Car Co., Bloomfield, N. J.
Windsor Automobile Co., Evansville, Ind.

Cigar Lighter.

International Auto. and Yacht Agency, 119-121 Nassau St., N. Y. City. "Radium."

Circuit Breakers.

American Coil Co., Foxboro, Mass.

Cleansing Compounds.

Baum's Castorine Co., Rome, N. Y. (Soap.)
Bridgeport Wood and Finishing Co., New Milford, Conn. ("Autoclean.")
Chandler and Farquhar Co., 34 Federal St., Boston, Mass.
Clenzol Co. (The), Newport News, Va. ("Clenzol.")
Cleveland Oil Soap Co., 197 Lake Ave., Cleveland, Ohio. ("Veg-Oil Soap.")
Coleman, H. P., 66 Stanhope St., Boston, Mass.
Ericka Mfg. Co. (The), Inc., 489 Worthington St., Springfield, Mass. ("Ericka Hand Soap" and "Ericka" Auto Cleaners.)
Fairchild, M. H., & Bro., 199 Mich. St., Chicago, Ill. (Soap.)
Fisk Mfg. Co., Springfield, Mass. (Soap.)
Forbes, B. P., 74 Franklin St., Cleveland, Ohio.
Ford & Dennen, 16 Thayer St., Boston, Mass. (Soap.)
Frost, F. E., 505 Main St., Worcester, Mass. ("Kuick-Klean.")
Hoffheimer Soap Co., Royal Insurance Bldg., Chicago, Ill. (Soap.)
Hollingshead Co., R. M., Camden, N. J. (Soap.)
Hulburt & Co., C., 115 N. Second St., Philadelphia, Pa.
Hydro-Palm Mfg. Co., Neponset Dis., Boston, Mass. ("Auto Puresope.")
Jewel Mfg. Co., 341 Franklin St., Chicago, Ill. (Leather and Fabric Cleaner and Color Renewers.)
Kirk, Jas. S. & Co., Chicago, Ill. ("Kirk's Amer. Crown" soap.)
Kleno Mfg. Co., North Weymouth, Mass. (Soap Bark Compound.)
Phoenix Oil Co., The, Cleveland, Ohio. ("Murphy's Oil Soap.")
Puro Mfg. Co., 203 Broadway, N. Y. City. ("Puro.")
Quick-Off Mfg. Co., P. O. Box No. 1911, Boston, Mass. ("Quick-Off" Soap.)
Roever, The Henry Co., Chester, Pa. ("Modoc.")
Rome Soap Mfg. Co., Rome, N. Y. (Soap.)
Skat Mfg. Co., Hartford, Conn. ("Skat.")
Smith, Jos. N., & Co., 4th and Porter Sts., Detroit, Mich. ("Magic Kleaner.")
Speare's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass. (Soap.)
Stanley, John T., 642 W. 30th St., N. Y. City. ("Mobo.")
Utility Co. (The), 235 Greenwich St., N. Y. City. ("Gre-Solvent.")
Waltke, Wm., & Co., East Grand Ave. and Second St., St. Louis, Mo. ("Lava" Soap.)
White & Bagley Co., Worcester, Mass. ("Washzum Car Soap," "Cleanzum" Hand.)
Young, Orlando W., 174-80 Frelinghuysen Ave., Newark, N. J. (Soap.)

Child's Seat (Cycle).

Cole, G. W., Co., 143 Broadway, N. Y. City.
Michigan Automobile Co., Ltd., Kalamazoo, Mich.

Clips and Clamps.

Clark, A. N., & Son, Plainville, Conn.

Clock Holders.

Coleman, H. P., 66 Stanhope St., Boston, Mass.
Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. (Watch Holders.)

Clocks (Automobile).

Bullard, J. H., Springfield, Mass. Speedometer, odometer and clock combined.)
Centaur Motor Co., 59 Franklin St., Buffalo, N. Y.
Chelsea Clock Co., 16 State St., Boston, Mass. (Also Boat.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Levy, Manasseh, & Co., 182 Broadway, N. Y. City.
Meyrowitz, E. B., 104 E. 23d St., N. Y. City.
Motor Car Equipment Co., The, 55 Warren St., N. Y. City.
Motor Car Specialty Co., 143 E. State St., Trenton, N. J. (Speed Meter, Odometer and Clock Combined.)
Post & Lester Co., The, 20 Sargeant St., Hartford, Conn.
Thorn Mfg. Co., 5 and 7 Front St., Salem, Mass.
Wheelock Motor Car Clock Co., Tremont Bldg., Boston, Mass.
Wilson, The Auto Clock Co., 935 Arch St., Philadelphia, Pa.

Clothing (Auto).

Auto Millinery Co., The, 237 Woodward Ave., Detroit, Mich. (Ladies' Auto Hats.)
Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich. (Rubber Capes.)
J. H. Bishop Co., The, Wyandotte, Mich.
Capper & Capper, 45-47 Jackson Blvd., Chicago, Ill. (Coats.)
Clark Glove Co., Peabody, Mass. (Leggings.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Gilbert Mfg. Co., New Haven, Conn. (Leggings—Sleeve Protectors.)
Hodgman Rubber Co., 806 Broadway, N. Y. City.
Laitin, I. and H., 289 Church St., N. Y. City. Fur Lined Overcoats.)
Mesinger, H. & F., Mfg. Co., 1801-3 1st Ave., New York City. (Leggins.)
Milford Co., The., Milford, Mass. (Leather.)
Moore-Smith Co., 250 Devonshire St., Boston, Mass. (Fur and Fur Lined Coats.)
Morawetz Co., The, 343 Broadway, Milwaukee, Wis. (Furs.)
Murray, Tom, Jackson Bv., near B. of T., Chicago, Ill. (Rain Coats.)
Nathan Novelty Mfg. Co., 88-90 Reade St., N. Y. City. (Sleeve Protectors.)
National India Rubber Co., Bristol, R. I. (Rubber Shirt.)
Post and Leather Co., The, Hartford, Conn. (Leggins.)
Raymond, A., & Co., 129-133 Fulton St., N. Y. City. ("Raymond.")
Rosenthal & Katz, 52 W. 13th St., New York City.
Saks & Co., Broadway, 33d to 34th Sts., New York City.
Scandinavian Fur and Leather Co., 14-16 W. 33d St., N. Y. City.
Scott Muffler Co., The, 175 Main St., Portsmouth, Ohio. (Muffler.)
Stern Bros., West 23d St., N. Y. City.
Teagan Bros., 246 Jefferson Ave., Detroit, Mich.
Triton Mfg. Co., 189 Jefferson Ave., Detroit, Mich.
Way Muffler Co., The, 23d and Arch Sts., Philadelphia, Pa. (Mufflers.)
Western Robe Co., Detroit. (Coats.)
Wiley, William H. & Son Co., The, Box 78, Hartford, Conn. (Leggins.)

Clothing (Yacht).

Greenwood-Atkinson-Armstrong Co. (The), Detroit, Mich.

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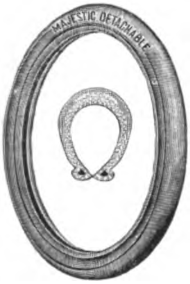
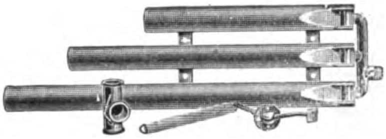
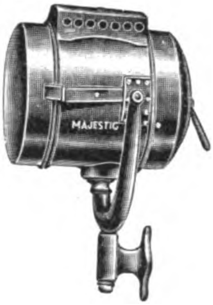
Best and Cheapest



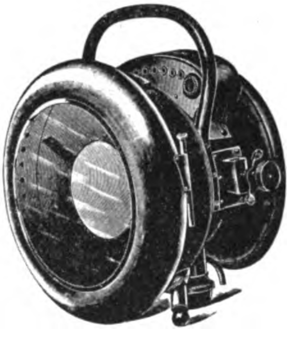
Majestic Detachable
Clincher Tires
Right in Construction
Right in Price
and with a
Right Guarantee



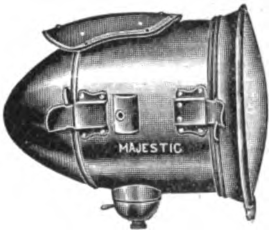
Majestic 3 Tube Horns, Brass Throughout, Accurately Toned and Our Prices will Surprise You.



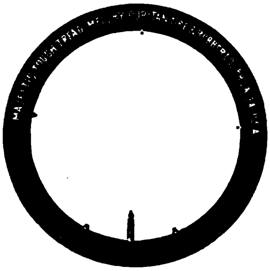
Majestic Search-Lights
Brass and Copper in All Sizes



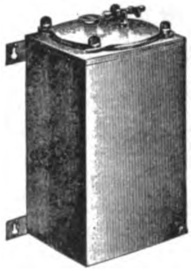
Majestic "Alpha" Pattern
Most Handsome Lamp Ever Designed



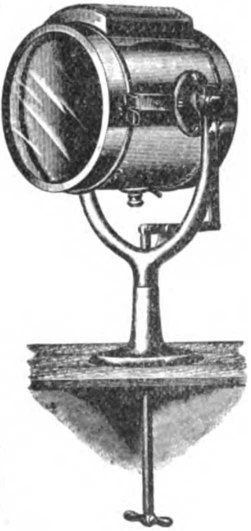
MAJESTIC BULLETS
Side Lamps



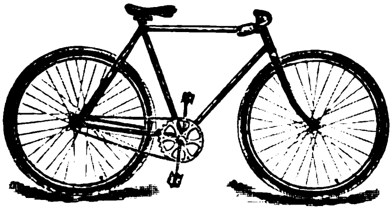
Majestic Single Tube Tires
Cannot be Excelled, Prices the Lowest



Majestic Generators
Simple and Perfect



MAJESTIC MARINE
SEARCH-LIGHTS



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NEW YORK, Madison Square Garden, January 13th to 20th. Space 203
CHICAGO, - Coliseum, - - February 3rd to 10th. " 269-270
BOSTON, - Mechanics' Hall, - March 10th to 17th. " 131-132

BUYERS' GUIDE—Continued

Clutches.

Automatic Clutch Co., Hamilton Building, Akron, Ohio.
Continental Motor Mfg. Co., 240-244 W. Lake St., Chicago, Ill.
Double Friction Coil Clutch Co., The, 42 River St., Chicago, Ill.
Garford Co., The, Elyria, Ohio.
Hatcher Auto-Parts Co., The, 138 The Viaduct, Cleveland, Ohio.
Johnson Carlyle Machine Co., Hartford, Conn.
Mietz, Aug., 128-138 Mott St., New York City.
North Chicago Machine Co., The, North Chicago, Ill.
Michigan Motor Co., 246 S. Front St., Grand Rapids, Mich.
Muncie Auto. Parts Co., Muncie, Ind.
Powell-Bacon Co., Omaha, Neb. (Power Cut-Out for White Cars.)
Smith, A. O., Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Trebert Gas Engine Co., 163 Main St., W., Rochester, N. Y.
Williams Electric Machine Co., The, Everett Building, Akron, Ohio. (Electric Friction and Mechanical.)

Clutch Leather.

Ireson Leather and Export Co., 148 High St., Boston, Mass.
Rahman, Geo., & Co., 6 Ferry St., New York City.

Cocks.

Ashton Valve Co., 271 Franklin St., Boston, Mass. (Compression and Pet Cocks.)
Columbus Brass Co., 43 N. 4th St., Columbus, Ohio.
Globe Brass Co., Detroit, Mich.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co., The, Cincinnati, Ohio.
Standard Gauge Mfg. Co., Syracuse, N. Y. (Compression, Priming and Air.)
Standard Gauge Mfg. Co., Syracuse, N. Y.

Coaster Brakes.

Aurora Automatic Machinery Co., Aurora, Ill. ("Thor.")
Corbin Screw Corporation, New Britain, Conn. (Motor Cycle "Corbin Duplex.")
Eclipse Machine Co., Elmira, N. Y. ("Morrow.")
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. ("Forsyth.")
New Departure Mfg. Co., Bristol, Conn. ("New Departure.")
Pope Mfg. Co., Hartford, Conn.
Standard Co., The, Torrington, Conn. ("Standard.")
Straight Mfg. Co., 1453 Niagara St., Buffalo, N. Y. (Also Two-Speed Brakes.)

Collapsible Bucket.

Duplex Folding Pail Co., 114 E. 14th St., N. Y. City.
Durkee, C. D., & Co., 2 South St., N. Y. City.
Goodrich, B. F., Co., Akron, Ohio.
National India Rubber Co., Bristol, R. I.

Commutators.

Western Motor Co., Logansport, Ind.
Thurston Mfg. Co., The, 366 E. 57th St., Chicago, Ill.

Condensers (Steam).

Century Auto-Power Co., East Orange, N. J.
Walker, E. C., 1913-1923 Logan St., Louisville, Ky.

Condenser Parts.

Bliss-Chester Co., 31 Mathewson St., Providence, R. I.

Controllers (Electric).

Elwell-Parker Electric Co. of America, Hamilton, Case Ave. and Belden St., Cleveland, Ohio.
General Electric Co., Schenectady, N. Y.

Cranes.

Ginter, J. M., Wooster, Ohio.
Nicholls, Wm. S., 253 Broadway, N. Y. City.

Cranks (Cycle).

Nelson, A., Mfg. Co., 67-69 S. Canal St., Chicago, Ill. (Crank Repair Tip.)
Straight Mfg. Co., 1453 Niagara St., Buffalo, N. Y.

Crank Hangers.

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill. ("A. & J.")
Corbin Screw Corporation, New Britain, Conn.
Great Western Mfg. Co., La Porte, Ind. ("Fauber.")
Straight Mfg. Co., 1453 Niagara St., Buffalo, N. Y.

Crank Hanger Parts.

Corbin Screw Corporation, New Britain, Conn.
Nelson, A., Mfg. Co., 67-69 S. Canal St., Chicago, Ill. ("Repair Parts.")

Crank Shafts.

American Die and Tool Co., Reading, Pa.
Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
Carpenter Steel Co., 1 Broadway, N. Y. City.
Columbus Screw and Machine Co., 244 Kaiser St., Columbus, Ohio.
Gill, P. H., & Sons, Forge and Mach. Works, Lorraine and Otsego Sts., Brooklyn, N. Y.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio.
Muncie Auto. Parts Co., Muncie, Ind.
Norton Grinding Co., Barbers Crossing, Worcester, Mass.
Standard Connecting Rod Co., Beaver Falls, Pa.
Tindel & Morris Co., Eddystone, Pa.

Curtain Fasteners.

Carr, F. S., 74 Pearl St., Boston, Mass.
Cowles, C., & Co., Water and Chestnut Sts., New Haven, Conn.
Neider, F. A., Co., Augusta, Ky. (Brass.)
Roehm & Davison, Ltd., Detroit, Mich. (Brass.)
Smith, Jos. N., Co., 4th and Porter Sts., Detroit, Mich.
Weiss, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

Curtains (Boat).

Boyle, John, & Co., 113-114 Duane St., N. Y. City, N. Y.

Cushions.

Baltimore Buggy Top Co., The, 700-2 Penn. Ave., Baltimore, Md.
Bauer Bros. Mfg. Co., 937-41 W. Eighth St., Cincinnati, Ohio.
Detroit Carriage Co., Detroit, Mich.
Fagg, M. W., 202 Front St., N. Y. City. (Boat.)
Frazier, W. S., & Co., Aurora, Ill.
Hill Mfg. Co., The, 1394-96 West Ave., Buffalo, N. Y.
Indianapolis Dash Co., The, Indianapolis, Ind.
Johns-Manville Co., H. W., 100 Williams St., N. Y. City. (Heat Resisting.)
Springfield Auto Top and Upholstering Co., 102-6 Dwight St., Springfield, Mass.
Ventilated Cushion Co., The, 417 Ashland Blk., Chicago, Ill.

Cycle Engines.

American Motor Co., 705 Center St., Brockton, Mass.
Armac Motor Co., 472 Carroll Ave., Chicago, Ill.
Aurora Automatic Machinery Co., Aurora, Ill. "Thor."
Crouch Motor Co., Stoneham, Mass.
Curtiss, G. H., Mfg. Co., Hammondsport, N. Y.
Detroit Cycle and Motor Co., 239 Jefferson Ave., Detroit, Mich.
Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo.
Harley-Davidson Motor Co., 315 37th St., Milwaukee, Wis.
Harrison, H. K., 378-380 E. 7th St., St. Paul, Minn.
Hoffman, W., Motor Works, 1253 N. Halsted St., Chicago, Ill.
The Kirkham Motor Mfg. Co., Bath, N. Y. "Hercules."
Mayo Damper Co., 355 Walnut St., Pottston, Pa.
Merkel Motor Co., Layton Park, Milwaukee, Wis.
Mitchell Motor Car Co., Racine, Wis. "Mitchell."
Motor Cycle Equipment and Supply Co., Buffalo, N. Y. "Erie."
Palmer Bros., Coscob, Conn.
Ross & Kramer, 5607 S. Halsted St., Chicago, Ill.
The Thiem Mfg. Co., Columbia Heights, Minn.
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul, Minn.
F. B. Widmayer, 2312 Broadway, N. Y. City.

Cycle Engine Parts.

American Motor Co., 705 Center St., Brockton, Mass.
Cassin, John E., Hanover, N. H. (Complete Set of Castings.)
Widmayer, F. B., 2312 Broadway, N. Y. City, N. Y.

Cycle Stands.

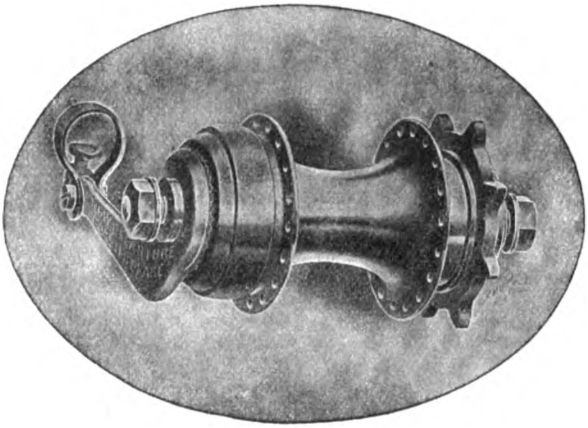
Cole, G. W., Co., 143 Broadway, N. Y. City. (Cycle Wall Racks or Holders.)
New England Cycle Sup. Co., Keene, N. H. (Truing Stands, Bench and Floor, Repair and Exhibition Stands.)

Cyclometers.

New Departure Mfg. Co., The, Bristol, Conn. ("New Departure" and "Security.")
Veeder Mfg. Co., Sargeant and Garden Sts., Hartford, Conn. ("Veeder.")

The New Departure

Take
a good
☞
look
at it



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at it

This is the **New Departure Coaster Brake.**
This is the Hub that made the name **"New Departure" famous.**
This is the Hub that made the cycle dealer prosperous.
This is the Hub that gave cycling a new lease on life.
This is the Hub that changed a grind into a glide.
This is the Hub that changed back-pedalling into one long, delightful coast.
This is the Hub that stands for **Safety, Pleasure,** and **Profits.**
Do you handle this Hub? if not, write us for particulars.
We can aid you. We can increase your business for the season of 1906.

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The NEW DEPARTURE MFG. CO.
BRISTOL, CONN., U. S. A.

Selling Agents
JOHN H. GRAHAM & CO., New York City

BUYERS' GUIDE—Continued

Cylinder Oil.

Allerton Oil and Grease Co., 78 Broad St., N. Y. City, N. Y.
Baum's Castorine Co., Rome, N. Y.
Columbia Lubricants Co., 78 Broad St., N. Y. City, N. Y.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Fiske Bros. Refining Co., 59 Water St., N. Y. City.
Geer, Harry R., 1017 Pine St., St. Louis, Mo.
Harris, A. W., Oil Co., 326 S. Water St., Providence, R. I.
Havemeyer Oil Co., The, 80 Broad St., N. Y. City, N. Y. "Havoline."
Hughes Anti-Friction Co., 8 Sherman St., Charlestown, Mass.
Hulbert, C., & Co., 115 N. Second St., Phila., Pa.
Kellogg, E. H., & Co., 243 South St., N. Y. City, N. Y. (Anti-Corrosive.)
Magie Bros., 9-11 N. Canal St., Chicago, Ill.
Miller's, Wm. P., Sons, 100 Greenpoint Ave., Brooklyn, N. Y.
Musliner, Joseph I., & Co., 204-206 Maiden Lane, N. Y. City, N. Y.
New Era Gas Engine Co., 7 Dale Ave., Dayton, Ohio.
N. Y. & N. J. Lubricant Co., 14-16 Church St., N. Y. City, N. Y.
Nye, Wm. F., New Bedford, Mass.
Robinson, Wm. C., & Son Co., 336-342 North St., Baltimore, Md.
Salem Chemical Supply Co., Salem, Mass.
Sheppard, W. S., 21 Lawrence St., Newark, N. J.
Speare's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass.
Valvoline Oil Co., 27 State St., Boston, Mass. "Valvoline."
Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

Dashes.

A. Z. Co., The, 462 Eleventh Ave., N. Y. City.
American Veneer Co., 100 Market St., Kenilworth, N. J.
Auto Body Co., The, Lansing, Mich.
Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.
Coops, C. W., Co., 3 Appleton St., Boston, Mass.
Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (Wood.)
Detroit Auto Specialty Co., 12-14 Sherman St., Detroit, Mich.
Fedders Mfg. Co., 1592-98 Genesee St., Buffalo, N. Y.
Hayes Mfg. Co., The, 825-45 Maybury Grand Ave., Detroit, Mich.
Indianapolis Dash Co., Indianapolis, Ind.
Kells, W. J., Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio. (Pressed Steel.)
Lawrence, L., & Co., 292 Halsey St., Newark, N. J.
McKinnon Dash Co., Amherst St., Buffalo, N. Y.
Mayo Radiator Co., The, State and Mill River Sts., New Haven, Conn.
Middletown Auto Body Co., Durham Road, Middletown, Conn.
Moore & Munger Co., 602 W. 52d St., N. Y. City.
Quinby, J. M., & Co., 1534 Broadway, N. Y. City.
Reading Metal Body Co., Fleetwod, Pa.
U. S. Aluminum Co., The, New Kensington, Pa. (Aluminum.)
U. S. Dash and Fender Co., The, 125 E. 42d St., N. Y. City.

Differential Gears.

Borbein, H. F., & Co., 2109 N. 9th St., St. Louis, Mo.
Boss Knitting Mach. Works, Reed and Elm Sts., Reading, Pa.
Boston Gear Works, 152 Purchase St., Boston, Mass.
Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y.
Bultman, F. H., & Co., 35 W. Centre St., Cleveland, O.
Cullman Wheel Co., 1020 Dunning St., Chicago, Ill.
Peter, Ferg, 50 Park St., Somerville, Mass.
Garford Co., The, Elyria, Ohio.
Gleason Works, Rochester, N. Y.
Muncie Auto. Parts Co., Muncie, Ind.
Neustadt Auto and Supply Co., 826 S. 18th St., St. Louis, Mo.
Smith, A. O., Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Spacke, The F. W., Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.
Warner Gear Co., Muncie, Ind. "Warner."
Webster Mfg. Co., 1075 W. 15th St., Chicago, Ill. (Hub.)

Distributors (Spark).

Bemus, T. Alton, 294 Washington St., Boston, Mass.
Altemus, C. L., & Co., The Bourse Bldg., Philadelphia, Pa.
Powell Mfg. Co., Utica, N. Y.
Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.
Mosler, A. R., & Co., 1679 Broadway, N. Y. City.

Dress Guards (Cycle).

Ossawan Mills Co., Norwich, Conn.

Dust Rings and Washers.

Booth, N. E., 261 39th St., Brooklyn, N. Y.
Wason & Booth Co., The, 341 Broadway, N. Y. City.

Dust Shields (Auto).

Brown, Will H., Lennox Bldg., Cleveland, Ohio.
Walker, E. C. Co., 1913-23 Logan St., Louisville, Ky.

Dynamos.

American Coil Co., Foxboro, Mass. "Little Giant."
Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O.
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago, Ill.
The Dayton Electrical Mfg. Co., 609-12 Reibold Bldg., Dayton, Ohio. "Apple."
Elbridge Electrical Mfg. Co., Elbridge, N. Y.
Fairbanks Co., Brown and Elm Sts., N. Y. City.
The Knoblock-Heideman Co., South Bend, Ind.
Motsinger Device Mfg. Co., Pendleton, Ind. "Auto Sparker."
Ohio Electric Works, 76-78 Ellen St., Cleveland, Ohio.
Schug Electric Mfg. Co., Champlain and Beaubien Sts., Detroit, Mich.
The Tritt Electric Co., Union City, Ind.

Electric Auto Motors.

Elwell-Parker Electric Co. of America, Hamilton, Case Ave. and Belden St., Cleveland, Ohio.
Essex Engineering Co., 54 Nassau St., Newark, N. J.
General Electric Co., Schenectady, N. Y.
Hertner Electric Co., 12-18 Frankfort St., Cleveland, Ohio
Holson Motor Patents Co., Ltd. (The), Grand Rapids, Mich. ("Holson" Hub Motor.)
Westinghouse Electric Mfg. Co., Pittsburg, Pa.

Emergency Cases.

Mamedion Chemical Co., 314 E. 79th St., N. Y. City.
U. S. Emergency Case Co., 11 Weaver Bldg., Utica, N. Y.

Enamels (Air Drying).

National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. ("High Pressure" and "Red Cross.")
Sherwin-Williams Co., The, 104 Canal St., Cleveland, O.

Enamels (Baking).

Detroit White Lead Works, 532 Milwaukee Ave., Detroit, Mich.
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill. ("Famous.")
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio.
Sherwin-Williams Co., The, 104 Canal St., Cleveland, Ohio.
Speare's, The Alden, Sons Co., 369 Atlantic Ave., Boston Mass.

Enameling Ovens.

National Cement and Rubber Mfg. Co., 3053-59 Monroe St. Toledo, Ohio. ("High Pressure and Red Cross.")

Engine Packings.

Booth, N. E., 261 39th St., Brooklyn, N. Y. (Felt.)
Eagle Oil and Supply Co., 104 Broad St., Boston, Mass "Eagleine."
Goodwin & Kintz, Winsted, Conn. (Copper Asbestos Gaskets.)
India Rubber Co., 16 Warren St., New York City.
Johns-Manville, H. W., Co., 100 William St., New York City. (Asbestos.)
Keasbey & Mattison Co., Ambler, Pa. "Ambler."
The Lubron Mfg. Co., 89 Broad St., Boston, Mass.
McCord & Co., 84 Van Buren St., Chicago, Ill. ("McKim" Copper Asbestos Gaskets.)

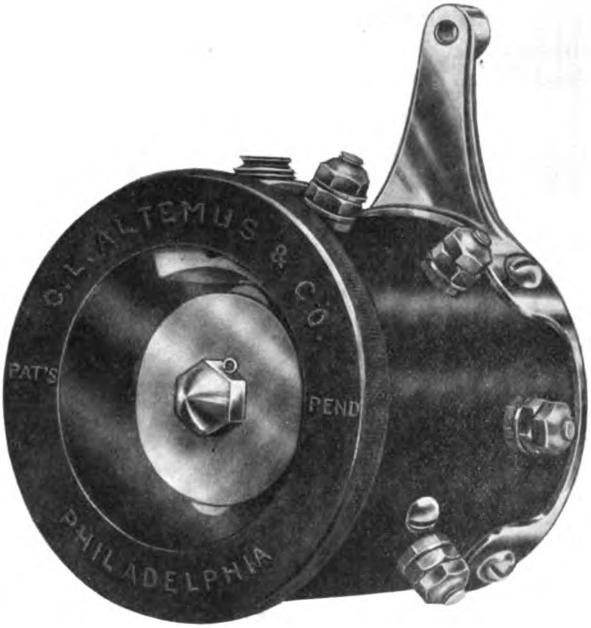
Engine Parts (Autos).

Barcus, Geo., & Co., Wabash, Ind. (Cylinders.)
Goodnow, L. H., Foundry Co., Fitchburg, Mass. (Fly Wheel.)
Hoffman Hinge and Foundry Co., Cleveland, Ohio.
Spacke, F. W., Machine Co., The, Madison Ave., Merrill and Penn Sts., Indianapolis, Ind. (Pistons, Connecting Rods and Fly Wheels.)
Standard Connecting Rod Co., Beaver Falls, Pa. (Connecting Rods, Strap Joints.)

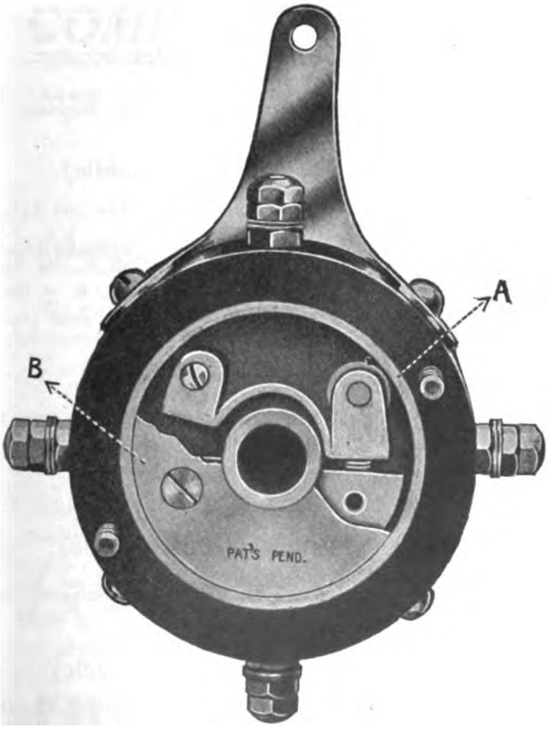
The Result of Concentration

Timers and Distributers are our **sole** product. We manufacture these devices **exclusively,** and have endeavored to produce the finest instruments possible.

Our 1906 models are the result ot intelligent study and careful tests, based on a long and expensive experience. We are therefore prepared to offer all our types with absolutely no apologies whatever. Our facilities are such as to enable us to make any type Timer in quantities from specifications of manufacturers.



1906 DISTRIBUTER



1906 "IDEAL" TIMER

Price on Stock Models

PRIMARY TIMER

1 cylinder	$4.50
2 cylinder	5.00
3 cylinder	5.50
4 cylinder	6.00

SECONDARY DISTRIBUTER

2 cylinder	$10.00
3 cylinder	12.00
4 cylinder	15.00
6 cylinder	30.00
8 cylinder	35.00

C. L. Altemus & Co.
THE BOURSE
Philadelphia, Pa.

Members National Association Engine and Boat Manufacturers

BUYER'S GUIDE—Continued

Engine Starters.

Auto Improvement Co., The, 304 Hudson St., New York City. "Ever Ready."
Lock Switch Mfg. Co., 20 Broad St., N. Y. City.

Expanders.

Corbin Screw Corporation, New Britain, Conn.
Ideal Plating Co., 3 Appleton St., Boston, Mass.
Reeves Ideal Mfg. Co., Saginaw, W. S., Mich.

Felt Washers.

Booth, N. E., 261 39th St., Brooklyn, N. Y.
Wason & Booth Co., The, 341 Broadway, N. Y. City.

Fenders.

A-Z Co., The, 462 Eleventh Ave., N. Y. City.
American Veneer Co., 100 Market St., Kenilworth, N. J.
Auto Body Co., The, Lansing, Mich.
Badger, E. B., & Sons Co., 63 Pitts St., Boston, Mass.
Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.
Broc. Carriage and Wagon Co., The, 417-21 Case Ave., Cleveland, Ohio.
Coope, O. W. Co., 3 Appleton St., Boston, Mass.
Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn.
Detroit Auto Specialty Co., 12-14 Sherman St., Detroit, Mich.
Fedders Mfg. Co., 1592-98 Genesee St., Buffalo, N. Y.
Gray, Peter & Sons, 88-90 Union St., Boston, Mass.
Hayes Mfg. Co., The, 825-45 Maybury Grand Ave., Detroit, Mich.
Indianapolis Dash Co., Indianapolis, Ind.
Kells, W. J., Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio.
McKinnon Dash Co., Amherst St., Buffalo, N. Y.
Moore & Munger Co., 602 W. 52d St., N. Y. City.
Pittsburg Reduction Co., The, Pittsburg, Pa.
Quinby, J. M., & Co., 1534 Broadway, N. Y. City.
Reading Metal Body Co., Fleetwood, Pa.
Springfield Metal Body Co., Brightwood, Springfield, Mass.
Sun Stove Co., 1305 Bellevue Ave., Detroit, Mich.
U. S. Aluminum Co., The, New Kensington, Pa. (Aluminum.)
U. S. Dash & Fender Co., 125 E. 42d St., N. Y. City.
Whitlock Coil Pipe Co., Hartford, Conn.

Fender Hangers.

Rahman, Geo., 6 Ferry St., N. Y. City.

Fire Extinguishers.

Automobile Fire Fighter, The, 804 Steinway Hall, Chicago, Ill.
Badger, E. B., & Sons Co., 63 Pitts St., Boston, Mass.
Johns-Manville Co., H. W., 100 William St., N. Y. City.
Little Giant Mfg. Co., The, 88 Wall St., N. Y. City ("Little Giant.")
Rex Fire Extinguisher Co., The, 152 Centre St., N. Y. City. ("Rex.")
U. S. Fire Extinguisher Mfg. Co., 134 W. 23d St., N. Y. City.

Flags and Pennants.

Annin & Co., Fulton and William Sts., N. Y. City, N. Y.
Carpenter, Geo. B., & Co., 202-208 South Water St., Chicago, Ill.

Flexible Shafts for Speed Indicators.

Automobile Supply Mfg. Co., 320 Driggs Ave., Brooklyn, N. Y.
Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.
Wood Speedometer Co., 106 Sudbury St., Boston, Mass.

Foot Rests (Auto).

Burrowes (The), E. T. Co., Portland, Me.

Forgings.

Amer. Drop Forging and Tool Co., Wayland, N. Y. (Special to Order.)
Bethlehem Steel Co., 100 Broadway, N. Y. City. (Nickel Steel.)
Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. ("B. & S.")
Bliss, E. W., Co., Brooklyn, N. Y.
Boston Forge Co., 340 Maverick St., E. Boston, Mass. ("Clark Nickel Steel.")
Carpenter Steel Co., 1 Broadway, N. Y. City.
Chicago Drop Forge and Foundry Co., Kensington, Ill.
Cleveland Hardware Co., Cleveland, Ohio. (Special.)
Consolidated Mfg. Co., Toledo, Ohio. (Special.)
Cramp, Wm., & Sons, S. & E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
Crescent Forgings Co., Oakmont, Pa.
Crucible Steel Forging Co., Cleveland, Ohio. (Steel.)
Ellis, F. L., & Son, Milldale, Conn.
Hayes Mfg. Co., The, 825-45 Maybury Grand Ave., Detroit, Mich. (Auto Irons.)
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio.
Jones, E. J. Co., Arlington Heights, Mass. (Rolled.)
Kilbourn & Bishop Co., New Haven, Conn.
Moore Drop Forging Co., Brightwood, Springfield, Mass.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Page-Storms Drop Forge Co., Brightwood, Chicopee Falls, Mass.
Ryman, K. L., Newark, N. J.
Seward, The, N. & Son. Co., Grant St., New Haven, Conn.
Smith, Jos. N. & Co., 4th and Porter Sts., Detroit, Mich. (Body Irons.)
Union Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.
Wilcox, Crittenden & Co., Middletown, Conn.
Williams, J. H., & Co., 150 Hamilton Ave., Brooklyn, N. Y.
Wyman & Gordan, 30 Bradley St., Worcester, Mass.

Forks (Cycle).

Reading Standard Cycle Mfg. Co., Reading, Pa. (Cushion.)
Standard Welding Co., 35 Cone St., Cleveland, Ohio. (Rear Forks and Stays.)

Forks (Motor Cycle).

Merkel Motor Co., Layton Park, Milwaukee, Wis.
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul, Minn.

Fork Crowns.

Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.

Fork Sides.

Consolidated Mfg. Co., Toledo, Ohio. (Brazed.)
Standard Welding Co., 35 Cone St., Cleveland, Ohio (Seamless.)

Frames (Automobile).

Cleveland Car Specialty Co., Case Ave. and Lake St., Cleveland, Ohio.
Kinsey Mfg. Co., Dayton, Ohio.
Midgley Mfg. Co., Dublin Ave., Columbus, Ohio.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Parish & Bingham Co., Hamilton St., E. of Coe St., Cleveland, Ohio.
A. O. Smith Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.

Frames (Boat).

Brooks Boat Mfg. Co., 1113 Wash. St., Bay City, Mich.

Frames (Cycle).

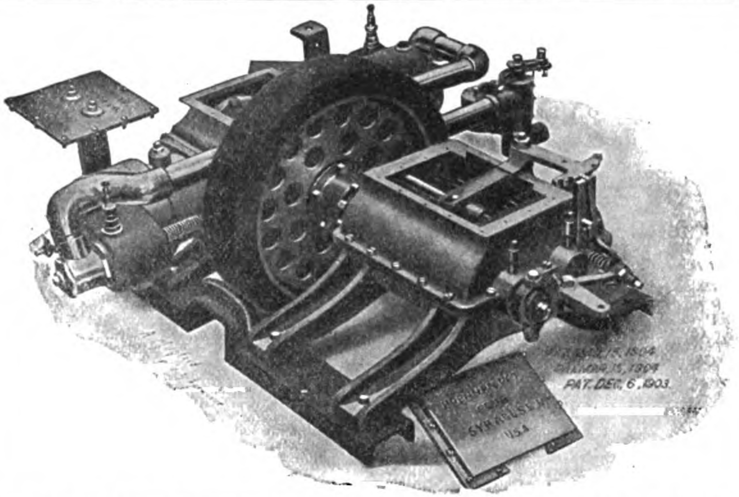
Toledo Metal Wheel Co., Toledo, Ohio.

Frames (Motor Cycle).

Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo.
Merkel Motor Co., The, Layton Park, Milwaukee, Wis.
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul, Minn.

Frame Fittings (Cycle).

Armac Motor Co., 472 Carroll Ave., Chicago, Ill. (Motor Cycle.)
Aurora Automatic Mach. Co., Aurora, Ill. (Motor Cycle "Thor.")
Crosby Co., The, 177-87 Pratt St., Buffalo, N. Y.
Crouch Motor Co., Stoneham, Mass. (Motor Cycle "Crouch.")
Kelsey Co., The, 43-45 Niagara St., Buffalo, N. Y. (Spring Attachment.)



BRENNAN STANDARD MOTOR

QUESTION OF POWER FOR 1906

COMPACT

ECONOMICAL

RELIABLE

Motor and Transmission practically all in one.

We make a specialty of motors of the horizontal type for various makes of cars.

Our 4 cylinder motors are built in 4 sizes:

18-24 H. P.
28-30 H. P.
32-35 H. P.
80 H. P.

Motors furnished mounted with full working drawings for any make of car.

We manufacture a complete line of TRANSMISSION GEARS, Shaft drive or double chain drive.

Correspondence Solicited.

Canton, Ohio, Dec. 9, 1905.

THE BRENNAN MOTOR CO.
Syracuse, N. Y.

Gentlemen:—

Kindly quote me price on a larger sprocket for transmission. We all agree that we should have a larger sprocket and have the car geared higher with the great power that is in this engine. This car is only a toy for the engine; there are no grades but what we can make on the high gear.

Yours truly,
Dr. F. E. DAUDS.

The Doctor has a 1904 Olds Touring Car equipped with Brennan 16 H. P. Motor and Transmission Gear.

BRENNAN MOTOR CO.
SYRACUSE, N. Y.

BUYERS' GUIDE—Continued

Fuel Level Indicators.

Automobile Tankometer Co., Room 60, 89 State St., Boston, Mass.
Blood Bros. Automobile and Machine Co., 44 N. Edwards St., Kalamazoo, Mich.
Boston Auto Gage Co., 614 Old South Bldg., Boston, Mass. ("Triumph.")
Crawford, W. B., 3739 Indiana Ave., Chicago, Ill. ("Martin.")
Kinsey Mfg. Co., Dayton, Ohio.
R. & O. Indicator Co., The, Bridgeport, Conn.

Fuel Regulators.

Boss Knitting Machine Works, Elm and Reed streets, Reading, Pa.
Century Auto Power Co., East Orange, N. J.
Clark, Edward S., 272-278 Freeport street, Boston, Mass.
Forg, Peter, 50 Park street, Somerville, Mass.
Mason Regulator Co., The, 158 Summer St., Boston, Mass.
Ofeldt, F. W., & Sons, Nyack, N. Y.
Walker, E. C. Co., 1913-1923 Logan St., Louisville, Ken.

Fuel Strainers and Separators.

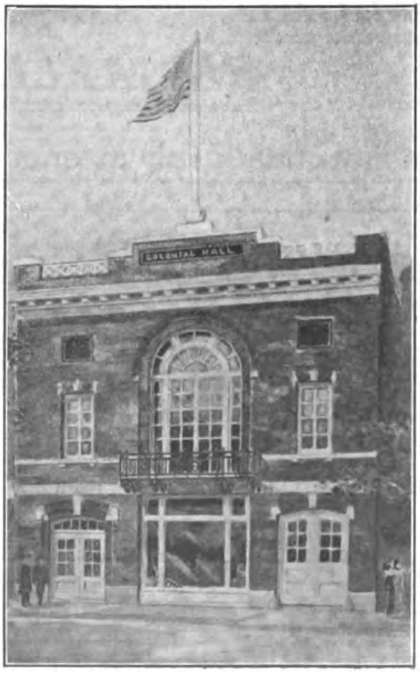
Boss Mfg. Co., Atlantic, Mass. "Boss."
Breeze Motor Mfg. Co., 33 Court St., Newark, N. J.
Cleveland Motor Boat Co., 1055 Detroit St., Cleveland, O.
Columbus Brass Co., 43-45 N. 4th St., Columbus, Ohio.
Fairmount Engineering Co., 3207 Spring Garden St., Phila., Pa. "Chadwick."
Ernest Flentje, Cambridge and Trowbridge Sts., Cambridge, Mass.
Hatcher Auto Parts Co., The, 138 The Viaduct, Cleveland, Ohio.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio.
Kaufman, Charles, Oshkosh, Wis.
Winkley Co., The, Box 243, Detroit, Mich. "Eureka."

Funnels.

Duplex Folding Pail Co., 111 E. 14th St., New York City. (Folding.)
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, O.
Taliaferro, W. T., 258 Broadway, N. Y. City.

Gasoline Auto Engines.

Albright Mfg. Co., The, Columbus, Ga.
American Die and Tool Co., Reading, Pa.
American Gasoline Motor Co., The, Baldwinsville, N. Y.
Aster Co., 1591 Broadway, N. Y. City.
Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.
Auto. Engine Works, St. Paul, Minn.
Auto Supply Co., Inc., 1662 Broadway, N. Y. City.
Bachmann, G. A., Motor Co., The, 3118 O'Donnell St., Baltimore, Md. "Little Wonder."
Beaver Mfg. Co., Milwaukee, Wis.
Bellfuss Motor Co., The, 223 Washington Ave., North, Lansing, Mich.
Beverly Mfg. Co., Beverly, Mass.
Blomstrom, A. H. Motor Co., The, 75 Clark Ave., Detroit, Mich.
Bowen Motor Co., 92 Baynes St., Buffalo, N. Y.
Bradford Motor Co., Bradford, Pa.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y. "Brennan."
Brown-Talbot Machinery Co., 438 Old South Building, Boston, Mass.
Burtt Mfg. Co., 124-130 N. Edwards St., Kalamazoo, Mich.
Carlson, Chas. A., 1060 Bedford Ave., Brooklyn, N. Y.
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw and Machine Co., 244 Kaiser St., Columbus, Ohio.
Continental Engine Co., Cor. Kinsbury and Huron Sts., Chicago, Ill.
Continental Motor Mfg. Co., 240-244 W. Lake St., Chicago, Ill.
Craig, James, 556 W. 34th St., N. Y. City, N. Y.
Crouch, Chas. P., & Co., 472-484 Carroll Ave., Chicago, Ill.
Curtiss, G. H., Mfg. Co., Hammondsport, N. Y.
Cushman Motor Co., 2020-2030 N St., Lincoln, Neb.
Davis Mfg. Co., Milwaukee, Wis.
Duquesne Construction Co., Jamestown, N. Y.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Eagle Automobile Co., 92 Hamilton St., Rahway, N. J.
Fairbanks Co., Brown and Elm Sts., N. Y. City.
Fairmount Engineering Co., 3207 Spring Garden St., Philadelphia, Pa.
Fast Machine and Tool Works, 1061-1063 29th Ave., Milwaukee, Wis.
Forsyth, W., & Son, Commercial and Charles Sts., West Lynn, Mass.
Funke, A. H., 83 Chembers St., N. Y. City. "Kelecom."



Colonial Hall will be completed in early Spring

THE leading, most reliable and one of the pioneer Automobile dealers of New Jersey. When my new building is completed in February, there will be no more commodious or better equipped Garage in the State.

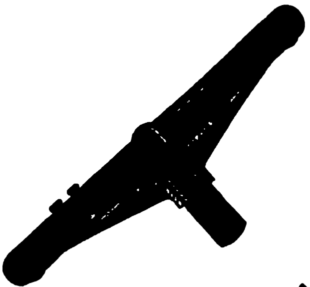
Chester C. Henry
SUMMIT, NEW JERSEY

Factory Agent for
Cadillac Automobiles

I will be at Madison Square Garden the entire week of the show (Jan. 13th to 20th) and will make my headquarters at the Cadillac Exhibit, where I will be very glad, indeed, to meet all of my friends, patrons, and in fact, anybody interested in Automobiles.

A Revolution
In Steering Gears

At last we have that long-sought and sorely needed device, a Steering Gear that has a perfect and single adjustment for wear on all bearings. Impossible for shoulders to form.



Pat. Applied For.

STRONG
COMPACT
OIL-TIGHT
QUADRANT
STATIONARY.

Easy to operate. Always dependable.

Irreversible

SAFE

Wouldn't it improve your car to have a gear with no lost motion to the wheel, that would always be easy to operate, no dangerous sticking points, and that is ahead-of-date and high-class in every other particular? We have it.

We have designed this gear in response to the universal demand for a more perfect steering apparatus. One that would do away with the annoyances and dangers of the present forms. It has been thoroughly tried out and we feel that we can correctly apply the word perfect to its action. All wear on all bearings is taken up with a single adjustment, which is very easily made. This adjusting nut may, if desired, be placed above the floor.

Workmanship and material throughout is of the highest quality. Gears will be furnished separate or complete with wheel, post, etc., ready to place in car. We have facilities for prompt delivery. This is an opportunity for the manufacturer to improve his car and an opportunity for the dealer to replace defective and unsatisfactory gears. Write for prices and printed matter.

We also build engines and other parts to blue-print. Send specifications for estimate.

Gemmer Engine Co. MARION, IND.

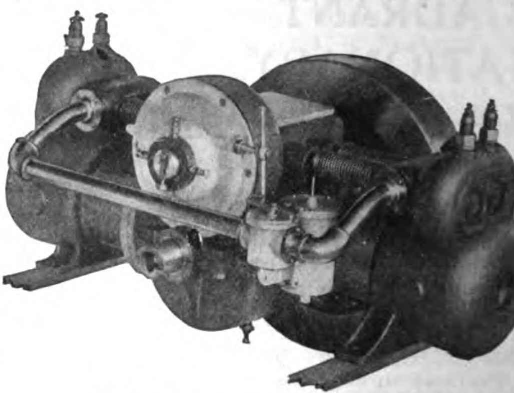
BUYERS' GUIDE—Continued

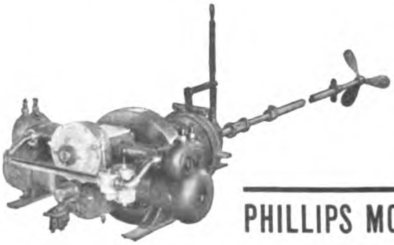
(GASOLINE AUTO ENGINES, CONTINUED)

Gemmer Engine Works, Marion, Ind.
Gilson Mfg. Co., 1000-1030 Park St., Port Washington, Wis.
Glazier & Briggs, 74-78 Sagamore St., Lynn, Mass. "Sagamore."
Globe Iron Works Co., Menominee, Wis. "White."
Goshen Motor Works, Goshen, Ind.
Grant-Ferris Co., Troy, N. Y. "Grant-Ferris."
Grout Bros. Automobile Co., Orange, Mass.
Hasbrouck Motor Works, Inc., New London, Conn.
Hatcher Auto Parts Co., The, 138 The Viaduct, Cleveland, Ohio.
Herschell-Spillman Co., N. Tonawanda, N. Y.
Hewitt Motor Co., 6-10 E. 31st St., N. Y. City.
Hoffman Hinge and Foundry Co., Cleveland, Ohio.
Hoffman, H. L., Motor Co., 47-49 S. Canal St., Chicago, Ill.
Hoffman, W., Motor Works, 1253 N. Halsted St., Chicago, Ill.
Holliday Mfg. and Engineering Co., 160 Bunker St., Chicago, Ill.
Houle, A. J., 580 East St., Holyoke, Mass.
Howard, W. S., Yonkers, N. Y.
Hoyt, G. P. B., Jamaica, N. Y.
Hub Motor Co., The, 34 Beach St., Boston, Mass.
Illinois Auto. and Parts Co., Main and Globe Sts., Peoria, Ill.
Judkins Show Case Co., East Providence Centre, R. I.
Kirkham Motor Mfg. Co., The, Bath, N. Y. "Kirkham."
Kowalsky Engine Co., Verona, Pa.
Lackawanna Mfg. Co., Newburgh, N. Y.
Lake View Automobile Co., 1049 Sheffield Ave., Chicago, Ill.
Lauth, J., & Co., 528 Elston Ave., Chicago, Ill.
Lehr Agricultural Co., The, Jackson St., Fremont, Ohio.
Lipman, Carl E. L., Beloit, Wis.
Locomobile Co. of America, Bridgeport, Conn.
Lozier Motor Co., 55th St. and Broadway, N. Y. City.
McClure & Buchner, 911 S. Homan Ave., Chicago, Ill.
McFadden Mfg. Co., Havana, Ill.
Mack Bros. Motor Car Co., South Allentown, Pa.
Mason, Wm. H., Mt. Carmel, Ill.
Mason Regulator Co., 158 Summer St., Boston, Mass.
Merchants' Specialty Co., 259 Greenwich St., N. Y. City, N. Y.
Merkel Motor Co., Layton Park, Milwaukee, Wis.
Michigan Automobile Co., Ltd., Kalamazoo, Mich.
Milwaukee Auto Engine and Supply Co., 706 Winnebago St., Milwaukee, Wis.
Milwaukee Motor Co., 615 Clybourn St., Milwaukee, Wis.
Mitchell Motor Car Co., Racine, Wis. "Mitc
Model Gas Engine Works, 175 Wabash Ave., A
Monroe Engine Co., 35 Congress St., Boston,
Motor Car Power Equipment Co., 577 Grove
kee, Wis. "Evinrude."
Motor and Mfg. Works Co., 107-113 N. Albany
N. Y.
Mottville Machine Works, Mottville, N. Y.
Muncie Auto Parts Co., Muncie, Ind.
Murray, W. B., 1253 Milwaukee Ave., Chicago
Neer Automobile Engine Co., The, 97 Lexi
Columbus, Ohio.
North Chicago Machine Co., The, North Chi
Neustadt Auto and Supply Co., 826-30 S. 1
Louis, Mo.
Newcomb Motor Co., 31 Nassau St., N. Y. City
Northway Motor and Mfg. Co., Maybury Gran
R. R., Detroit, Mich.
Palmer Bros., Coscob, Conn.
Phillips Motor Works, 133 La Salle St., C
"Phillips Duplex."
Pierce Engine Co., The, Racine, Wis.
Pokorney, H., Automobile and Gas Engin
Bellefontaine St., Indianapolis, Ind.
Pungs-Finch Auto and Gas Engine Co., Detr
Reeves Pulley Co., Columbus, Ind.
Rice, John V. J. & Co., Bordentown, N. J.
Rochester Gas Engine Co., Driving Park Ave.
N. Y.
Rogers, Geo. D., Automobile Parts Mfg. C
Kinsman St., Cleveland, Ohio.
Ross & Kramer, 5607 S. Halsted St., Chicago,
Runyen, James, & Sons, Redkey, Ind.
Sandusky Foundry and Machine Co., Sandus
Schilling, C. R., 810 N. Main St., St. Louis,
Seitz, F. A., & Co., 390 Webster Ave., L. I.
Shipman Mfg. Co., The, Sunbury, Pa.
Smith, A. Parker, Jr., 113 Highland St., Broc
Smith, Geo. D., Jr., Baldwins, L. I., N. Y.
Smith & Mabley, Inc., Broadway, between 5
Sts., N. Y. City.
Smith & Williams, Columbus, Ohio.
Sommer Motor Co., Box 138, Detroit, Mich.
Speed Changing Pulley Co., 750 E. Washing
dianapolis, Ind.
Sterling Engine Co., 121 Grant St., Buffalo,
Streit, A., Machine Co., The, 1108-10 Harriso
cinnati, Ohio.
Sturtevant Mill Co., Harrison Sq., Boston, M
Termatt & Monahan Co., River and Bay St
Wis.

PHILLIPS DUPLEX GOVERNED MOTOR 1

2 to 14 h. p.
Fitted with sliding gear or planetary transmission. Sold with or without governor or fittings or
"READY TO RUN"
on sub-base for General Power Purposes, Electric Lighting, Running Shops, Charging Batteries, etc., etc.





Sold Ready to Run for Motor Boa
Auxiliary Power

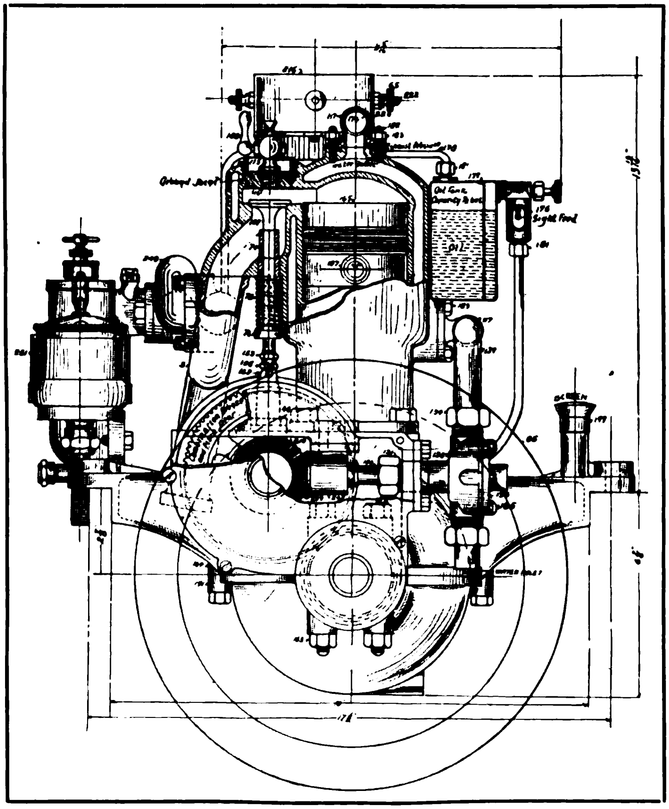
The surest, safest and steadiest marine
made. Extra spark, extra gasoline feed.
and very accessible, governing feature ex
for reversible propeller. No racing of moto
throwing clutch.

PHILLIPS MOTOR WORKS, 133 LaSalle St., Chicag

MR. AUTO MANUFACTURER

Are you interested in securing the best power plant for your cars? If so, we can please you, as the **KIRKHAM MOTORS FOR 1906 CANNOT BE EXCELLED.**

This cut represents our 15-20 H.P. 4-cylinder Water-Cooled Auto Motor. Weight complete, 265 pounds. **We Guarantee** 26 H.P. under brake test. Are you interested? If so we will be pleased to hear from you with specifications.



We have other sizes including a **Six-Cylinder 25 H.P. Motor of Above Type.** Also **Three-Cylinder 12-14 H.P.** Water-Cooled and 14 H.P. Air-Cooled which we can deliver from stock.

We are also prepared to manufacture on contract any size or quantity of gasoline automobile motors. Can also supply transmission gears, clutches, etc., for the above machines.

If you are in the market for any of this material better consult us before placing your order as our prices and goods will surprise you.

THE KIRKHAM MOTOR MFG. CO., Bath, N.Y.

BUYERS' GUIDE—Continued

(GASOLINE AUTO ENGINES, CONTINUED.)

Torbensen Motor Car Co., Bloomfield, N. J.
Trebert Gas Engine Co., 163 Main St., Rochester, N. Y.
Trebert Auto and Marine Motor Co., 407 St. Paul St., Rochester, N. Y.
Truscott Boat Mfg. Co., St. Joseph, Mich.
Waite Gas Engine Co., The, Milwaukee, Wis.
Westerfield Motor Co., 1525 Main St., Anderson, Ind.
Western Motor Co., Logansport, Ind.
Western Tool Works, The, Galesburg, Ill.
Westinghouse Electric and Mfg. Co., Pittsburg, Pa.
York Automobile Co., York, Pa.

Gasoline Cans.

Brown Oil Can Co., The, 1352 Dawson St., Toledo, O. (Self Sealing.)
Dunn Pump and Measure Co., Anderson, Ind.
Harps, J. A., Mfg. Co., Greenfield, Ohio. "Neverfail."

Gasoline Engine Fittings.

Diamond Stamped Ware Co., Summit Ave., Detroit, Mich. (Copper Water Jackets.)
Fairmount Engineering Co., 3207 Spring Garden St., Philadelphia, Pa. (Governors.)
Lunkenheimer Co., The, Cincinnati, Ohio. (Cocks.)
Spacke, F. W., Machine Co., The, Madison Ave., Merrill and Penn Sts., Indianapolis, Ind. (Piston Rings.)

Gasoline Storage Outfits.

Bowser, S. F., & Co., Inc., Fort Wayne, Ind.
Boyer-Radford & Gordon Tank and Pump Co., Dayton, O.
Gilbert & Barker Mfg. Co., 82 John St., N. Y. City.
Hydraulic Oil Storage & Distributing Co., 1002 Penobscot Bldg., Detroit, Mich.
International Non-Explosive Tank Co., 140 Nassau St., N. Y. City.
Iron Clad Mfg. Co., 204 Varet St., Brooklyn, N. Y. (Steel gasoline storage barrels).
Kaltenback, Fred., 10 N. Jefferson St., Chicago, Ill.
Koven, L. O. & Bro., 50 Cliff St., N. Y. City.
National Tank Co., Dayton, Ohio.
Sexton Can Co., 2 Hartford St., Boston, Mass.
Tokheim Mfg. Co. (The), Cedar Rapids, Iowa.
Western Oil Pump Co., 2437 Kosciusko St., St. Louis, Mo.

Gasoline Tank Gauges.

Auto Improvement Co., 304 Hudson St., New York City. "Ever Ready."
Boston Auto Gage Co., 614 Old South Bldg, Boston, Mass.

Gauges.

Ashcroft Mfg. Co. (The), 85-87-89 Liberty St., N. Y. City. (Steam).
Ashton Valve Co., 271 Franklin St., Boston Mass. (Steam, water and air gauges).
Gleason-Peters Air Pump Co., 20 Houston St., N. Y. City.
Lunkenheimer Co. (The), Cincinnati, Ohio.
Jas. P. Marsh, 224 Washington St., Chicago, Ill.
Standard Gauge Mfg. Co., Syracuse, N. Y. (Steam, air and water.)
Star Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass.

Gauge Light.

Chicago Battery Co., Michigan Ave., and Fourteenth St., Chicago, Ill.
Wilkinson & Co., A. J. 180-188 Washington St., Boston, Mass.

Gauntlets.

Clark Glove Co., Peabody, Mass.
Detroit Leather Specialty Co., Mich. and Beecher Aves., Detroit, Mich. "Boulevard."
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Hansen, O. C. Mfg. Co., 352 E. Water St., Milwaukee, Wis.
Heagle, James, Cor. First Ave. and Market Sts., Johnstown, N. Y.
Kibbe & Tomlinson, Batavia, N. Y.
Morawetz Co. (The), 343 Broadway, Milwaukee, Wis.
Pontiac Knitting Co., Pontiac, Mich. (Knit.)
Post & Lester Co., 20 Sargeant St., Hartford, Conn.
Saks & Co., Broadway, 33d and 34th St., N. Y. City.
Scandinavian Fur & Leather Co., 14-16 W. 33d St., N. Y. City.
Western Robe Co., Detroit, Mich.

Gear Blanks.

Gill, P. H. & Sons, Forge and Mach. Wks. (The), Lorraine and Otsego Sts., Brooklyn, N. Y.
Standard Welding Co., 33 Cone St., Cleveland, Ohio. (Rings).

Gear Cases (Automobile).

Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Muncie Auto. Parts Co., Muncie, Ind.
Warner Gear Co., Muncie, Ind.

Gears and Pinions.

American Die & Tool Co., Reading, Pa.
Baldwin Chain & Mfg. Co., Dept. B, 31 Hermon St., Worcester, Mass.
Boston Gear Wks., 152 Purchase St., Boston, Mass. (Rawhide, steel and fiber).
Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y.
Brown & Sharp, Mfg. Co., Providence, R. I.
Bultman, F. H. & Co., 35 W. Center St., Cleveland, Ohio.
Carriage Wheel & Gear Co., Merrimac, Mass.
Chicago Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill. (Rawhide and metal).
Cramp (The) & Sons S. & E. B. Co., Beach and Ball Sts, Phila., Pa.
Fellows Gear Shaper Co. (The), Springfield, Vt.
Ferg, Peter, No 50 Park St., Somerville, Mass.
Gleason Works (The), Rochester, N. Y.
Gould & Eberhardt, 99 W. R. R. Ave., Newark, N. J. (Cycle and auto).
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio. (Bevel).
Lee & Porter Mfg. Co., Buchanan, Mich. (Cycle.)
Meisel Press & Mfg. Co., 944-948 Dorchester Ave., Boston, Mass.
Muncie Auto. Parts Co., Muncie, Ind.
Neustadt Auto & Supply Co., 826-30 S. 18th St., St. Louis, Mo. (Bevel.)
New Process Raw Hide Co., Plum St., Syracuse, N. Y. (Raw Hide Pinions and Metal Gears.)
Nuttall, R. D. Co., Duquesne Way., Pittsburg, Pa.
Spacke (The) F. W. Mach. Co., Madison Ave., Merrill & Penn St., Indianapolis, Ind.
Syracuse Rawhide Mfg. Co., 506-510 S. Clinton St., Syracuse, N. Y. (Rawhide.)
Van Dorn & Dutton Co. (The), 1796 E. Madison St., Cleveland, Ohio.
Warner Gear Co., Muncie, Ind.

Generators (Acetylene).

American Lamp Works, 66 W. 43d St., N. Y. City.
Angiulli, Luigi, 180-182 Center St., N. Y. City.
Badger Brass Mfg. Co., Kenosha, Wis.
Colt, J. B. Co., 21 Barclay St., N. Y.
Columbus Brass Co., 43-45 N. 4th St., Columbus, Ohio.
Dayton Mfg. Co., Dayton, Ohio.
R. E. Dietz Co., 35 Laight St., N. Y. City.
Eco Mfg. Co., 53 State St., Boston, Mass.
Edmund & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich.
Funke, A. H., 83 Chambers St., N. Y. City.
Gray & Davis, Amesbury, Mass.
Hine-Watt Mfg. Co., 69 Wabash Ave., Chicago, Ill.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Moore, M. E. & Son Co., Westfield, Mass.
New York Coach & Auto Lamp Co., 798 10th Ave., N. Y. City.
Richmond, Indiana, Mfg. Co., Richmond, Ind.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. (Never-out.)
Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J.
Scoville & Peck Co., 15 Wooster St., New Haven, Conn.
Standard Carriage Lamp Co., 43-49 S. Canal St., Chicago, Ill.
Stevens Co., 99 Chambers St., N. Y. City.

Goggles and Masks.

Chicago Eye Shield Co., 112 Randolph St., East Chicago, Ill.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Funke, A. H. 83 Chambers St., N. Y. City.
Globe Optical Co., 403 Washington St., Boston, Mass.
Meyrowitz, E. B., 104 E. 23d St., N. Y. City.
Mills Mfg. Co. (The), 10 E. 23d St., N. Y. City.
Ophthalmuscope Co. (The), 3324 Monroe St., Toledo, O.
Scandinavian Fur & Leather Co., 14-16 W. 33d St., N. Y. City.
Scheidig, John & Co., 50 Maiden Lane, N. Y. City.
Sussfeld, Lorsch & Co., 37 Maiden Lane, N. Y. City.

Grademeters.

Adams Co. (The), Dubuque, Iowa.
Motor Car Supply Co. (The), 1427 Michigan Ave., Chicago, Ill. "Updown."
Sussfield, Lorsch & Co., 37 Maiden Lane, N. Y. City. (Altitude.)

Graphite.

Baum's Castorine Co., Rome, N. Y.
Cook's Adam Sons, 313 West St., N. Y. City. "Albany."
Jos. Dixon Crucible Co., Jersey City, N. J. "Dixon." "L. A. W." "No. 635." "Auto and Bi.," "Graphitoleo."
Graphite Lubricating Co., The, Bound Brook, N. J.
National Cement & Rubber Mfg. Co., 3053-3069 Monroe St., Toledo, Ohio.
Obermayer (The), S. Co., Chicago, Ill.
U. S. Graphite Co., Saginaw, Mich.

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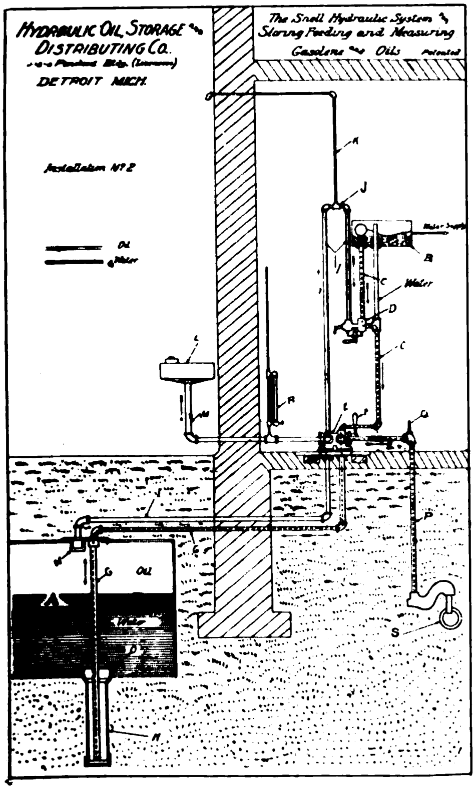
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Benobscot Building, Detroit, Michigan.

BUYERS' GUIDE—Continued

Greases.

Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill.
Allerton Oil & Grease Co., 78 Broad St., N. Y. City.
Anti-Friction Lubricant Co., Washington, D. C.
Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Baum's Castorine Co., Rome, N. Y.
Besly, Chas. H. & Co., 15-21 Clinton St. Chicago, Ill. "Helmet."
Borne, Scrymser Co., 135 Front St., N. Y. City. "Silex."
Bruck Solidified Oil Co., 406 Atlantic Ave., Boston, Mass. "Solidified oil."
Cole, G. W. Co., 143 Broadway, N. Y. City. "3-in-1."
Columbia Lubricants Co. of N. Y., 78 Broad St., N. Y. City. "Monogram and initial."
Crescent Mfg. Co., Scottdale, Pa. "Lackawanna."
Draper, Walter H. Co., Mt. Vernon, N. Y.
Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. "Eagleine."
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill.
Fiske Bros. Refining Co., 59 Water St., N. Y. City. "Lubroleine."
Harris, A. W. Oil Co., 326 S. Water St., Providence, R. I. Auto.
Haws, Geo. A., 73 Pine St., N. Y. City.
Hollingshead, R. M. Co., Camden, N. J. (Chain lubricant.)
Hughes Anti-Friction Co., 8 Sherman St., Charlestown, Mass.
Kellogg, E. H. & Co., 243-244 South St., N. Y. City. "Anti-friction, "Excelsior."
Lubron Mfg. Co., The, 89 Broad St., Boston, Mass.
Magie Bros., 9-11 N. Canal St., Chicago, Ill.
Miller's, Wm. P., Sons, 100 Greenpoint Ave., Brooklyn, N. Y. "Miller," "Excelsior," Bearing, Gear and Chain.
Musliner, Joseph I. & Co., 204-206 Maiden Lane, N. Y. City.
National Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. (Chain and gear and almond oil.) "Oil-ine," "High Pressure," "Chainine" and "Red Cross."
New Departure Mfg. Co. (The), Bristol Conn. "New Departure."
Penn. Petroleum Co., 117 N. 2d St., Phila. Pa.
Phila. Grease Mfg. Co. (The), The Bourse, Philadelphia, Pa.
Salem Chemical & Supply Co., Salem, Mass.
Speare's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass.
Tingley, Chas. O. & Co., Rahway, N. J.
Vacuum Oil Co., 29 Broadway, N. Y. City.
Valvoline Oil Co., 27 State St., Boston, Mass. Auto.—"Valvoline."
White & Bagley Co., Worcester, Mass.
Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

Grease Cups.

American Lubricator Co., Detroit, Mich.
Besly, Chas. H. &. Co., 15-21 S. Clinton St., Chicago, Ill.
Bowen Mfg. Co., Canal St., Auburn, N. Y. (Ratchet and plain.)
Cooks, Adam Sons, 313 West St., N. Y. City, N. Y.
Crescent Mfg. Co., Scottdale, Pa.
Detroit Lubricator Co., Hodges Bldg., Detroit, Mich.
Erie Stamping & Mfg. Co., Erie, Pa.
Essex, G. B. Brass Co., 480 Franklin Ave., Detroit, Mich.
Hatcher Auto-Parts Co., The, 138 The Viaduct, Cleveland, Ohio.
Hussey Drop Forge & Mfg. Co., Axtell St., Cleveland, Ohio.
Lunkenheimer Co. (The), Cincinnati, Ohio.
Michigan Lubricator Co., 661-71 Beaubien St., Detroit, Mich.
Powell, Wm. Co., 2525-2531 Spring Grove Ave., Cincinnati, Ohio.
Sherman, H. B. Mfg. Co., Battle Creek Mich.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Thiem Mfg. Co., The, Columbian Heights, Minn.
Winkley Co. (The), P. O. Box 243, Detroit, Mich. (Ratchet.) "Crown."

Grips (Auto).

Arlingtoon Co., 475 Broadway N. Y. City.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.

Grips (Cycle).

Goodrich, B. F. Co., Akron, Ohio. Soft Rubber.
Mesinger, H. & F. Mfg. Co., 1801-03 1st Ave., N. Y. City. (Leather).
Noonan Tool and Mach. Works, 103½-105 Dominick St., Rome, N. Y.
Wolverine Leather Goods Co., Detroit, Mich.
Woodworth Bros., Newton Highlands, Mass.

Hampers.

A-Z Co. (The), 462 Eleventh Ave., N. Y. City. (Met
Automible Equipment Co., 251 Jefferson Ave., Detr Mich.
Auto Top & Specialty Co., Broadway and 63d St., N. Y. City.
Baille Basket Co., 85-87 Hudson St., Boston, Mass.
Boyle, John & Co., 112-114 Duane St., N. Y. City.
Buxton, B. W., 7 Taylor St., Springfield, Mass. "Buxton."
Hall, E. L., 239 E. 27th St., N. Y. City. "M. & A."
Heywood Bros. & Wakefield Co., 174 Portland St., Boston, Mass.
Poughkeepsie Suit Case Co., Poughkeepsie, N. Y.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.
Willowcraft Shops (The), North Cambridge, Mass.

Handle Bars.

Consolidated Mfg. Co., Toledo, Ohio. "Hussey."
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Geer, Harry R. Co., 1017 Pine St., St. Louis, Mo. (Motor cycle.)
Ideal Plating Co., 3 Appleton St., Boston, Mass. (Cycle and motor cycle, "Ideal.")
Kelly Handle Bar Co., 385 Perkins Ave., Cleveland, Ohi ("Kelly.")
Reading Standard Cycle Mfg. Co., Reading Pa.

Hardware (Auto).

Central Mfg. Co., Connersville, Ind.
Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.
English & Mersick Co., New Haven, Conn.
Lee Mfg. Co. (The), South Park, Port Huron, Mich. (Hinges on contract.)
Neider, F. A. & Co., Augusta, Ky.
Parry, A. N. & Co., Amesbury, Mass.
Smith, Jos. N. & Co., 4th and Porter Sts., Detroit, Mich. (Locks.)
Straight Mfg. Co., 1453 Niagara St., Buffalo, N. Y.
Woodruff (The), Walter W. & Sons Co., Mt. Carmel, Conn.
Yale & Towne Mfg. Co., The, 9-15 Murry St., N. Y. City. (Locks.)

Hardware (Marine).

Auto, Brass & Aluminum Co., Flint, Mich.
Diamond Chain and Mfg. Co., 241 W. George St., Indianapolis Ind. (Brass chain.)
Carpenter, Geo. B. & Co., 202-208 South Water St., Chicago, Ill.
Marine Hardware Co., Peabody, Mass.
Midland Metal Co., Inc., 1427-33 Catharine St., Philadelphia, Pa.

Heaters.

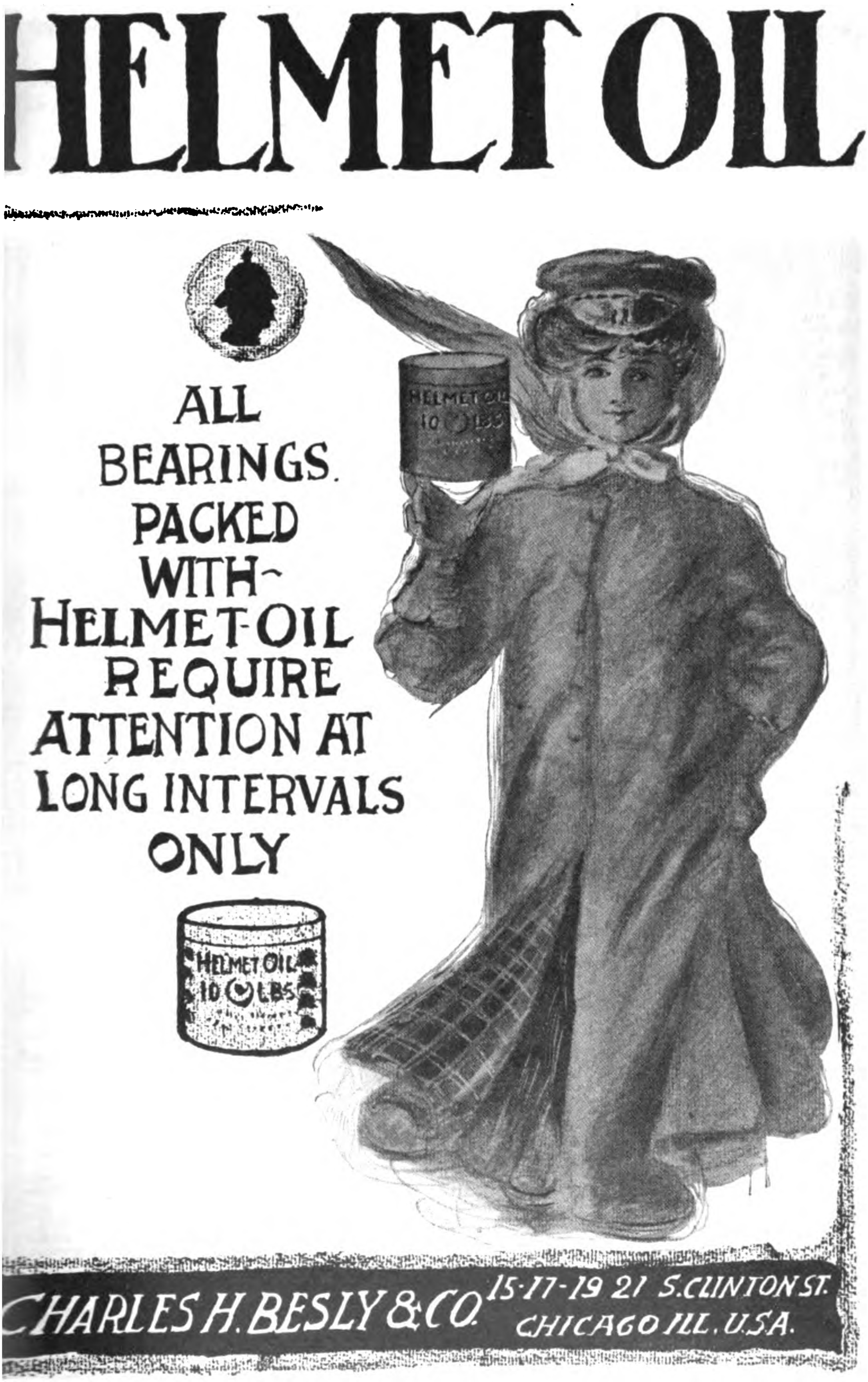
Chicago Auto Heater Co., 285 N. State St., Chicago, Ill. "H. & H."
Lehman Bros., 10 Bond St., N. Y. City.
Manhattan Automobile School, 315-321 W. 96th St., N. Y. City.
Novelty Mfg. Co., Dept. 3, Jackson, Mich. "X-radium."
Seaman, Willis F., Mineola, L. I., N. Y.
Standard Stamping Co., Marysville, Ohio.

Hoods.

A-Z Co. (The), 462 Eleventh Ave., N. Y. City.
Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.
Borbein, H. F. & Co., 2109 North 9th St., St. Louis, Mo.
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.
Detroit Auto Specialty Co., 1214 Sherman St., Detroit, Mich.
Detroit Carriage Co., Detroit, Mich.
Diamond Stamped Ware Co., Summit Ave., Detroit, Mich.
Fedders Mfg. Co., 1592-98 Genesee St., Buffalo, N. Y.
Gray, Peter & Sons, 88-90 Union St., Boston, Mass.
Hayes Mfg. Co. (The), 825-45 Maybury Grand Ave., Detroit, Mich
Kells, W. J. Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio.
Lawrence, L. & Co., 292 Halsey St., Newark, N. J.
Long Mfg. Co., 381-385 Wabash Ave., Chicago, Ill.
Long-Turney Mfg. Co., Rome, N. Y.
Mayo Radiator Co. (The), State and Mill River Sts., New Haven, Conn.
Middletown Auto Body Co., Durham Road, Middletown, Conn.
Neustadt Auto and Supply Co., 826-30 S. 13th St., St. Louis, Mo.
Quinby, J. M. & Co., 1534 Broadway, New York City.
Reading Metal Body Co., Fleetwood, Pa.
Springfield Metal Body Co., Brightwood, Springfield,
Sun Stove Co., 1305 Bellevue Ave., Detroit, Mich.
U. S. Aluminum Co. (The), New Kensington, Pa. minum.)
Whitlock Coil Pipe Co., Hartford, Conn.

Hood Blinds.

Worcester Pressed Steel Co., Worcester, Mass.



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CHICAGO ILL. U.S.A.

BUYERS' GUIDE—Continued

Hose Connectors and Menders.

Pittsburgh Hose Connector Co., 3623 Sarah St., Pittsburg, Pa. (Connectors.)
Sherman, H. B. Mfg. Co., Battle Creek, Mich. (Clamps and Menders.)

Horns (Automobile).

Automobile Supply Mfg. Co., 320 Driggs Ave., Brooklyn, N. Y.
Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Mechanically operated.)
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Funke, A. H., 83 Chambers St., New York City.
Gabriel Horn Mfg. Co., 970-72 Hamilton St., Cleveland, O.
Gleason-Peters Air Pump Co., 20 W. Houston St., New York City.
Goodrich, B. F., Akron, Ohio.
Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich. (Chime whistle.)
Hutchinson Electric Horn Co., Suite 9033 No. 1 Madison Ave., N. Y. City.
King Dodo Horn Co., Piqua, Ohio.
Motor Car Equipment Co. (The), 55 Warren St., New York City.
New York Coach and Auto Lamp Co., 798 10th Ave., New York City.
Riley-Klotz Mfg. Co., 19 Mulberry St., Newark, N. J.
Stevens & Co., 99 Chambers St., New York City.
Twentieth Century Mfg. Co., 19 Warren St., N. Y. City. "Twentieth Century."
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. (Electric.)
Willis, E. J. Co., 10 Park Place, New York City.

Horns (Boat).

Funke, A. H., 83 Chambers St., N. Y. City, N. Y.
Hutchinson Electric Horn Co., Suite 9033, No. 1 Madison Ave., N. Y. City, N. Y.
Lothrop, L. D., Gloucester, Mass.
Motor Car Equipment Co. (The), 55 Warren St., N. Y. City, N. Y.
Willis, E. J. Co., 10 Park Place, N. Y. City, N. Y.

Horns (Cycle).

Twentieth Century Mfg. Co., 19 Warren St., N. Y. City. ("Twentieth Century.")

Horns (Motor Cycle).

Twentieth Century Mfg. Co., 19 Warren St., N. Y. City. ("Twentieth Century.")

Horn Blowers.

Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Gas Engine Whistle Co., 1133 Broadway, N. Y. City.
King Dodo Horn Co., Piqua, Ohio.
Willis, E. J. Co., 10 Park Place, N. Y. City.

Horn Parts.

B. & J. Mfg. Co., 1218-20 Michigan Ave., Chicago, Ill.
New York Coach and Auto Lamp Co., 798 10th Ave., N. Y. City. (Brass flexible horn tubes.)
Stevens & Co., 99 Chambers St., New York City. Flexible tubing, screens and bulbs.)

Houses (Automobile).

American Portable House Co., 319 Arcade Bldg., Seattle, Wash.
Burnham-Standeford Co., Washington and First Sts., Oakland, Cal.
C. & A. Patented Building Construction Co., 170 Broadway, N. Y. City.
Hodgson, E. F., Dover, Mass.
Keasbey & Mattison Co., Ambler, Pa. (Asbestos.)
Lloyd, The Iron Roofing & Paint Co., Sta. U, Chicago, Ill.
Mershon & Morley Co., Saginaw, Mich. (Portable.)
Smith, H. W., Room 1512, No. 66 Broadway, N. Y. City.
Springfield Moulding Works, 58 Waltham Ave., Springfield, Mass.

Hubs (Automobile).

American Ball Bearing Co., Seward St. and L. S. & M. S. Ry., Cleveland, Ohio.
American Die and Tool Co., Reading, Pa.
American Roller Bearing Co., So. Framingham, Mass.
Harris, E. T., 531-545 W. 15th St., Chicago, Ill.
Jamesville Mfg. Co., Jamesville, N. Y.
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa. (For wooden and wire wheels.)
Muncie Auto. Parts Co., Muncie, Ind.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Smith, O. A. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Standard Roller Bearing Co., 49th and Girard Ave., Philadelphia, Pa.
Timken Roller Bearing Axle, Canton, Ohio.

Hubs (Cycle).

Aurora Automatic Machinery Co., Aurora
Corbin Screw Corporation, New Britain, C
Harris, E. T., 531-45 W. 15th St., Chica
Giant," "Harris," "Mound City," "
gasus" and "Famous.")
Jamesville Mfg. Co., Jamesville, N. Y.
New Departure Mfg. Co., Bristol, Conn.
speed.)
Reading Standard Cycle Mfg. Co., Readin
Toledo Metal Wheel Co., Toledo, Ohio.

Hub Parts (Automob

Crosby Co. (The), 177-187 Pratt St., Buf
Worcester Pressed Steel Co., Worcester,

Hulls.

Electric Launch Co. (The), 179 Avenue A,
Hasbrouck Motor Wks., Inc., New London
Matthews Boat Co. (The), Bascom, Ohio.
Michigan Steel Boat Co. (The), Detroit,
Neumeister, Fred. P., Rockford, Ill. (Kn

Hull Coating.

Gardiner, Geo. N. & Son, 15 William St.
New Jersey Paint Works, Jersey City, N.

Hydrometer.

Meyrowitz, E. B., 104 E. 23rd St., N. Y. C
Post & Lester Co. (The), Hartford, Conn.
Scheidig & Co., John, 50 Maiden Lane, N
Storage Battery Supply Co., 239 E. 27th St
Vuille, Chas. A., Huntingdon, Pa.
Witherbee Igniter Co., 54 W. 43rd St., N.

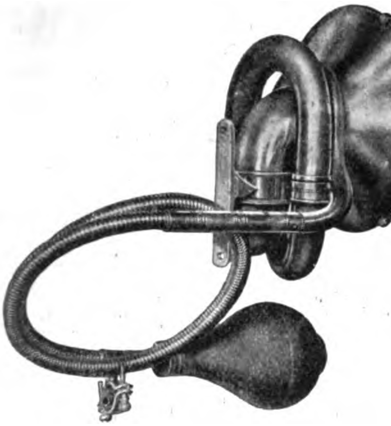
Ignition Apparatus (Misce

Baker & Co., Inc., 408-414 N. J. R. R. A
J. (Sparking points, igniter tubes,
and wire, iridio platinum rivets.)
Boker, Herman & Co., 101 Duane St., N. Y
alloy for ignition tubes and "Meteor"
ing points.)
Bown Machine Co., Ltd., 92 Jefferson Ave
Creek, Mich. (Spark plug holders.)
Briggs, W. H., 424 Bedford Ave., Brooklyn,
Dayton Electrical Mfg. Co. (The), 609-12
Dayton, Ohio. (Combined igniting and
Frankel Display Fixture Co., 177 Hudson
(Testing clip.)
Gary, Theo. H. & Co., 396-398 Broadwa
(Glass battery jars.)
Goodson Electrical Ignition Co., 94 Point
R. I. (Insulated wire.)
Grant-Ferris Co., Troy, N. Y.
Hart Mfg. Co., 370 Atlantic Ave., Boston,
grips.)
Herz & Co., 189 Elm St., N. Y. City. (C
Hewitt Motor Co., 6-10 E. 31st St., New Yo
inum iridium contact points.)
Judd & Leland Mfg. Co., Clifton Springs
tery box brass parts.)
Knoblock-Heideman Co. (The), South Be
lated wire.)
Lang, James S., Boston, Mass. (Incandesc
Littlefield, H. A., & Co., 16 Avon St., We
(Compensators.)
Marine Launch Igniting and Lighting Co.
N. Y. (Complete outfit.)
Mosler, A. R. & Co., 1679 Broadway, N. Y.
Motor Car Supply Co. (The), 1427 Michigan
Ill. (Switch plugs and levers.)
Newport Engineering Co., 359-367 Thames
R. I. (Plug protector.)
Packard Electric Co., Warren, Ohio. (Cab
Peninsular Milled Screw Co., 751-755 Bell
troit, Mich. (Spark plug shells.)
Rubay, Leon, 140 West 38th St., N. Y. C
wire.)
Shain, Chas. D., 70 Murray St., N. Y. Cit
Sittman & Pitt, State St. and Boerum P
N. Y. (Nuts and studs.)
Splitdorf, C. F., 23 Vandewater St., N. Y.
Stuart, C. H., Newark, N. Y. (Spark plug
Thermo Electric Co. (The), Room 1039, No
New York, N. Y. (Combined current
muffler.)
Tuttle, D. M., Canastota, N. Y. (Spark p

Ignition Apparatus Fit

Motor Car Supply Co. (The), 1427 Michigan
Ill. (Points and vibrators.)
Nelson, A. Mfg. Co., 67-69 S. Canal St.
(Bushings.)

WRITE FOR OUR NEW HORN CATALOG



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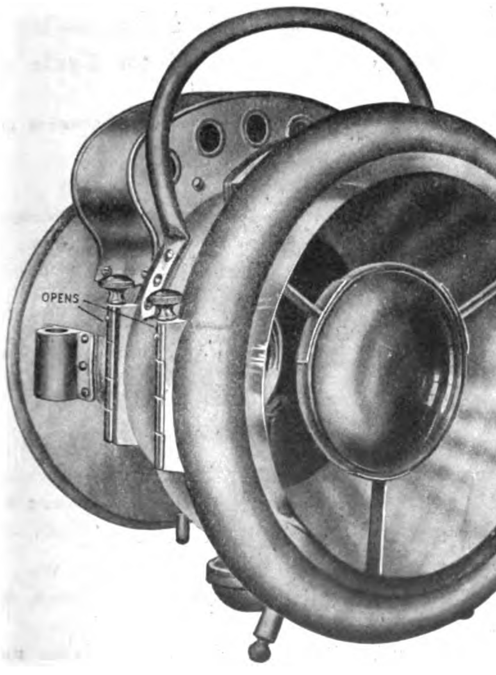
No. 810	Dia. of Bell	6⅛"	Each	$ 9.00
No. 811	" " "	7"	"	10.00
No. 812	" " "	8"	"	12.75



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Two sizes of this beautiful lamp, which is only one of the many styles in the complete Royal De Luxe line. Standard size, **$15.00**, large size, **$21.00**. Scientifically focused and thoroughly well made. A complete catalog of the splendid Royal De Luxe line sent on request.

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THE POST & LESTER CO., HARTFORD, CONN.

BUYERS' GUIDE—Continued

Ignition Batteries.

American Battery Co., 172-174 S. Clinton St., Chicago, Ill.
American Coil Co., Foxboro, Mass.
American Electrical Novelty & Mfg. Co., Spring, Hudson and Vandam Sts., N. Y. City.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y.
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago, Ill.
Chicago Battery Co., Michigan Ave. and Fourteenth St., Chicago, Ill. ("Duro.") cago, Ill. ("Duro.")
Chicago Pneumatic Tool Co., Fisher Bldg., Chicago, Ill.
Columbia Battery Co. (The), State and Third Sts., Milwaukee, Wis.
Dayton Electrical Mfg. Co. (The), 609-12 Reibold Bldg., Dayton, Ohio. (Apple-Duplex.)
Dayton Mfg. Co., Dayton, Ohio.
Dow Portable Electric Co., Braintree, Mass.
Eastern Carbon Works, West Side Ave. and Central R. R., Jersey City, N. J.
Edison Storage Battery Co., Glen Ridge, N. J.
Electric Contract Co., 202-4 Centre St., N. Y. City.
Electric Storage Battery Co., 19th St. and Allegheny Ave., Philadelphia, Pa.
Empire State Dry Battery Co., 70 Fulton St., N. Y. City.
Gordon Battery Co., 439-445 E. 144th St., N. Y. City. (For boats only.)
Gould Storage Battery Co., 1 West 34th St., N. Y. City. "Gould."
Haschke Compound Storage Battery Co., 87-89 Ashland Blvd., Chicago, Ill.
Hutchison Electric Horn Co., Suite 9033, No. 1 Madison Ave., New York, N. Y.
Koener Accumulator Industrie (The), 276 Blackhawk St., Chicago, Ill.
Lion Dry Battery Co., 241-247 Centre St., New York, N. Y. "Lion."
Look Electric Co. (The), 536-538 Wabash Ave., Chicago, Ill.
MacRae, H. C., 314 St. Paul St., Baltimore, Md. "Champion."
National Battery Co., 368-382 Massachusetts Ave., Buffalo, N. Y. "Sperry."
National Carbon Co., W. Madison and Highland Ave., Cleveland, Ohio. "Columbia."
New England Motor Co., 82 Fletcher St., Lowell, Mass.
Northwestern Storage Battery Co., 285 E. Madison St., Chicago, Ill.
Nungesser Electric Battery Co., 27-33 King St., Cleveland, Ohio.
Ohio Electric Works, 76-78 Ellen St., Cleveland, Ohio.
Roche, Wm., Dry Battery Co., 52-54 Park Pl., N. Y. City.
Rogers, Geo. D., Automobile Parts Mfg. Co., 56 Kinsman St., Cleveland, Ohio.
Royal Battery Co., 143 Chambers St., N. Y. City. (National Sales Corporation, 256 Broadway, N. Y. Factory Sales Mgr.) "Geecee."
Rubay, Leon, 140 West 38th St., N. Y. City.
Schwartz, A. E. & Co., 1655 Broadway, N. Y. City.
Semi-Dry Battery Co., 73 Hamilton St., Newark, N. J. "Dunn."
Smith Storage Battery Co., Zoar, Ohio.
Storage Battery Supply Co. (The), 239 E. 27th St., N. Y. City.
United Electrical Mfg. Co., 53 Vesey St., N. Y. City. "Crescent."
Universal Electric Storage Battery Co., Railway Exchange, Chicago, Ill.
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. "Vesta."
Wells, Chester, 1178 Bedford Ave., Brooklyn, N. Y.
Wilhelm, H., Battery Co., 70-72 Frost St., Brooklyn, N. Y.
Willard Storage Battery Co., 29 Academy St., Cleveland, Ohio.
Witherbee Ignitor Co., 541 N. 43rd St., N. Y. City.

Importers (Auto Goods).

Angiulli, Luigi, 180-182 Centre St., New York City. (Angelicus Lamps.)
Automobile Supply Co. (The), 1339 Michigan Blvd., Chicago, Ill. (Spark plugs and coils.) "P. D." and "Alpha."
Champion, Albert Co., 541 Tremont St., Boston, Mass. (Spark plugs, spark coils, storage batteries, limousine electric lights, ignition wire, magnetos, oilers, ammeters, voltmeters and siren whistles.)
Coops, C. W. Co., 3 Appleton St., Boston, Mass.
Dac Automobile Supply House, 1739 Broadway, N. Y. City.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Heller, Joseph S., 123 W. 52nd St., New York City. ("Pipe" cars; "Simms" safety buffer.)
Herz & Co., 189 Elm St., New York City. (French coils and storage batteries.)
Holcombe & Co., 45 Vesey St., New York City. (Spark plugs.)
Manufacturers' Agency Co., 1679 Broadway, N. Y. City. (Automobile parts.)
Miller, Chas. E., 97-101 Reade St., New York City. (Auto parts and supplies.) (Auto jewelry and horns.)
Motor Car Equipment Co., 55 Warren St., N. Y. City. (Accessories and supplies.)
Napier Motor Co. of America, 743 Boylston St., Boston, Mass. (Napier motor cars, launches, motors and transmissions.)
National Automobile Co., 205-9 E. 86th St., N. Y. City. (Mercedes parts.)
N. Y. Sporting Goods Co., 17 Warren St., New York City.
Post & Lester Co. (The), 20 Sergeant St., Ha (Horns, lamps, ammeters, spark plugs, volt coils, ammeters, and goggles.)
Prosser, Thos. & Son, 15 Gold St., N. Y. C Steel.)
Rubay, Leon, 140 W. 38th St., New York C nental and Michelin tires, auto horns, La tion apparatus.)
Shain, Chas. D., 70 Murray St., New York Cit
Skinner, K. A., 179 Clarendon St., Boston, Dion cars, motor and parts; Brouhat Car
Smith & Mabley, Inc., Broadway, between 5 Sts., N. Y. City. (Billy lamps, "Panhard," and "Mercedes" cars, "Hercules" anti-ski
Stallforth, G. & Co., 396-398 Broadway, N. Y. plugs; mica cores.)
Sussfield, Lorsch & Co., 37 Maiden Lane, (Miscellaneous French auto. supplies.)
Viqueot Co. (The), Borden and Review Aves., City, N. Y. ("Viqueot" Cars.)
Wooster, Wm. Bicycle Co., 10 Barclay St., Ne

Importers (Cycle Goods

Hendee Mfg. Co., 216 Worthington St., Sprin ("Brooks" motor cycle saddles.)
Leng's, John S. Sons & Co., 93 Reade St., N.
Wooster, Wm. Bicycle Co., 10 Barclay St., N.

Inner Tubes (Auto).

Continental Rubber Works, Erie, Pa.
Empire Rubber Mfg. Co. (The), Post Office B ton, N. J.
Morgan & Wright, 331-339 W. Lake St., Chica

Inner Tubes (Cycle).

International Auto and Vehicle Tire Co., Mil

Inner Tube Bags.

Gilbert Mfg. Co., New Haven, Conn.
Nathan Novelty Mfg. Co., 88-90 Reade St., Ne

Instruction (Auto, Motor Cy Boat).

Correspondence School of Automobile Enginee Flatiron Bldg., N. Y. City.

Insulation.

American Lava Co., Chattanooga, Tenn.
Cavanaugh & Darley, 21-25 Plymouth Court, C
Delaware Hard Fibre Co., Wilmington, Del.
Gary, Theo. H. & Co., 396-398 Broadway, N (Porcelain tubes.)
Imperial Porcelain Works, Trenton, N. J. tubes.)
Massachusetts Chemical Co., Walpole, Mass.
Schoonmaker, A. O., 221 Fulton St., N. Y. insulating bushings and washers; mica core
Star Porcelain Co., Trenton, N. J. (Porcelain
Sun Porcelain Co., Oakland Ave., Trenton, N. lain for spark plugs.)

Insurance (Auto).

Tobin, Joshua F., 500 Fifth Ave., N. Y. City.

Iron Castings.

Acme Steel and Malleable Iron Works, 245 Mili Buffalo, N. Y.
Acorn Brass Mfg. Co., 56 S. Peoria St., Chic
Arcade Malleable Iron Co., Worcester, Mass.
Barcus, Geo. & Co., Wabash, Ind.
Belle City Mfg. Co., Box D, Racine Junction,
Brown & Sharpe Mfg. Co., Providence, R. I.
Buhl Malleable Co., Wight and Adair Sts., Det
Capitol Foundry Co. (The), Hartford, Conn.
Enterprise Foundry Co., Detroit, Mich.
Felix Mfg. Co., 2 Auburn Ave., Buffalo, N. Y.
Fulton Foundry and Machine Co., 21 Furman lyn, N. Y.
Hart, Wm. R., 12 Allen St., Lawrence, Mass.
Hoffman Hinge and Foundry Co., Cleveland, O
Hopson & Chapin Mfg. Co., New London, Co
Houle, A. J., 580 East St., Holyoke, Mass. (
Interstate Foundry Co., Sheridan St. and C. Cleveland, Ohio.
Janney, Steinmetz & Co., 4th and Market Sts.,
Kalamazoo Novelty Co., Kalamazoo, Mich.
Lozier Motor Co., 55th St. and Broadway, N.
Manufacturers' Foundry Co. (The), Waterbury,
National Car Wheel Co., Pittsburg, Pa.
Naugatuck Malleable Iron Co. (The), Naugatuc
Palmers & De Mooy Foundry Co., Cleveland, O
Perkins, Henry & Co., Bridgewater, Mass.
Phoenix Automobile Supply Co., 3939 Olive St., Mo. (Engine.)

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BUYERS' GUIDE—Continued

Port Huron Engine and Thresher Co., Port Huron, Mich.
Racine Boat Mfg. Co., Muskegon, Mich.
Racine Brass and Iron Co., Racine, Wis.
Spencer, I. H. & Co., 10 S. Ewing Ave., St. Louis, Mo. (Cycle engine.)
Stowell Mfg. and Foundry Co., S. Milwaukee, Wis.
Trumbull Mfg. Co., Warren, Ohio.
Western Malleable and Gray Iron Castings Co., Milwaukee, Wis.
Western Motor Co., Logansport, Ind.
Wilcox, Crittenden & Co., Middletown, Conn.

Jacks.

Auto Bed Co. (The), 36 Columbus Ave., Boston, Mass. "Autobed."
Buckeye Jack Mfg. Co. (The), Louisville, Ohio.
Cooks Railway Appliance Co., Kalamazoo, Mich.
Covert Mfg. Co., West Troy, N. Y.
Duff Mfg. Co., Westinghouse Bldg., Pittsburg, Pa. "Barrett."
Eureka Mower Co., Utica, N. Y.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Garlick Auto Prop Co., Madison Ave. and Broadway, Paterson, N. J. (Auto Prop.)
Globe Jack Co., 827 N. Fourth St., Philadelphia, Pa. "Globe."
Hardy, The R. E. Co., 225 W. Broadway, N. Y. City.
Jersey Brake Co., 56 Columbia St., Newark, N. J. "Searls."
Leather and Brass Mfg. Co., 22-24 Water St., Auburn, N. Y. (Pneumatic.)
Lockhart, W. J., 24 Beach St., Boston, Mass.
Miami Pattern Works, Dayton, Ohio.
Oliver Mfg. Co., 203 S. Desplaines St., Chicago, Ill. "Peerless."
Pioneer Pole and Shaft Co., Piqua, Ohio.
Pope Mfg. Co., Hartford, Conn. "Kenosha."
Shunk, J. Q., Bucyrus, Ohio.
Roth Jack and Tool Co., 68 William St., Room 508 N. Y. City.
Shawver Co. (The), Springfield, Ohio.
Ultra Pump and Power Co., Auburn, N. Y.
Wray Pump and Register Co., 191 Mill St., Rochester, N. Y.

Jobbers (Automobile Parts and Supplies).

Auto Accessories Mfg. Co. (The), 165-269 Jefferson Ave., Detroit, Mich.
Automobile Buyers' Association, 98 Chambers St., N. Y. City.
Automobile Supply Co. (The), 1339 Michigan Blvd., Chicago, Ill.
Auto Supply Co., Inc., 1662 Broadway, N. Y. City.
Ball-Fintze Co. (The), Newark, Ohio.
Beckley-Ralston Co., 178 Lake St., Chicago, Ill.
Borbein, H. F. & Co., 2109 9th St., St. Louis, Mo.
Boston Cycle and Sundry Co., 48 Hanover St., Boston, Mass.
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago, Ill.
Chandler & Farquhar Co., 34 Federal St., Boston, Mass.
Coleman, H. P., 66 Stanhope St., Boston, Mass.
Coops, C. W. Co., 3 Appleton St., Boston, Mass.
Cushing, J. M., Jamestown, N. Y. (Auto steps.)
Dac Automobile Supply House, 1739 Broadway, N. Y. City.
DuBois Searchlight Co., 220 Broadway, N. Y. City.
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill.
Foote, D. E. Rubber Co., 56 Frankfort St., Cleveland, Ohio. (Tires.)
Gibney, J. L. & Bro., 211 N. Broad St., Philadelphia, Pa. (Tires and rubber sundries.)
Graham Cycle Co., 601-605 Madison St., Chicago, Ill.
Guarantee Tire and Bicycle Co. (The), Indianapolis, Ind.
Hine-Watt Mfg. Co., 69 Wabash Ave., Chicago, Ill.
Johnson's, Iver, Sporting Goods Co., 163 Washington St., Boston, Mass.
Kasner, A. H., 152 Church St., N. Y. City. (Tires.)
Kelsey Co. (The), 43-45 Niagara St., Buffalo, N. Y.
King Mfg. and Garage Co., Springfield, Ohio.
Leng's, John S. Sons & Co., 93 Reade St., N. Y. City.
McDonald, Wessels & Ames Co., 29 Washington Ave., Detroit, Mich.
Manhattan Storage Co., 42-44 Cortland St., N. Y. City.
Marks, Hiram, Detroit, Mich.
Miller, Chas. E., Anderson, Ind.
Monnier Auto and Cycle Supply Co., The, Detroit, Mich.
Motor Car Equipment Co., 55 Warren St., N. Y. City.
Motor Car Supply Co. (The), 1427 Michigan Ave., Chicago, Ill.
National Casket Co., Chicago, Ill. (Robes, overcoats, heaters.)
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
N. Y. Sporting Goods Co., 17 Warren St., N. Y. City.
Nock, Geo. W., 126 N. 4th St., Philadelphia, Pa.
Phoenix Automobile Supply Co., 3939 Olive St., St. Louis, Mo.
Post & Lester Co. (The), 20 Sargeant St., Hartford, Conn.
Progressive Cycle and Automobile Supply Co., 81 Chambers St., N. Y. City.
Reading Automobile Co., 26-28 S. Fifth St., Reading, Pa.
Sidney E. Robey Co. (The), 208 South Ave., Rochester, N. Y. (Supplies.)
Shain, Chas. D., 70 Murray St., N. Y. City.
Sibley & Pitman, 26 Warren St., New York City.
Simmons Co., John, 104-110 Centre St., New York City. (Steam vehicle fittings.)
Walker Co., E. C., 1913 Logan St., Louisville, Ky.
Wills, E. J., 10 Park Place, N. Y. City.
Wing, Charles Co. (The), Amesbury, Mass. (Springs, steps and trimmings.)
Wooster Bicycle Co. William, 10 Barclay St., N. Y. City.

Jobbers (Boat Materials).

Durkee, C. D. & Co., 2 South St., N. Y. City, N. Y.
Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo.
Hopkins, John C. & Co., 119 Chambers St., N. Y. City.
Manhattan Storage Co., 42-44 Cortlandt St., N. Y. City.
Miller, Chas. E., 97-101 Reade St., N. Y. City.
Morse, A. S. Co., 210-212 Commercial St., Boston, Mass.
N. Y. Sporting Goods Co., 17 Warren St., N. Y. City.
Sands, A. B. & Sons Co., 242 Water St., N. Y. City.
Terry & Co., 92 Chambers St., N. Y. City. (Marine Eng Fittings. Marine Hardware.)

Jobbers (Cycle Parts and Fittings).

Ball-Fintze Co. (The), Newark, Ohio.
Beckley-Ralston Co., 178 Lake St., Chicago, Ill.
Excelsior Supply Co., 211 E. Randolph St., Chicago, Ill.
Kelsey Co. (The), 43-5 Niagara St., Buffalo, N. Y.
Leng's, John S. Sons & Co., 93 Reade St., N. Y. City.
Manhattan Storage Co., 42-44 Cortlandt St., N. Y. City.
Manufacturers' Supply Co., 418 Arch St., Phila., Pa.
Miller, Chas. E., 97-101 Reade St., N. Y. City.
N. Y. Sporting Goods Co., 17 Warren St., N. Y. City.
Nock, Geo. W., 126 N. 4th St., Philadelphia, Pa. "Nock
Progressive Cycle and Automobile Supply Co., 81 Chambers St., N. Y. City.

Jobbers (Cycle Sundries).

Foote, D. E. Rubber Co., 56 Frankfort St., Cleveland, Ohio. (Tires.)
Gibney, J. L. & Bro., 211 N. Broad St., Philadelphia, Pa. (Tires and rubber sundries.)
Kelsey Co. (The), 43-5 Niagara St., Buffalo, N. Y.
Leng's, John S. Sons & Co., 93 Reade St., N. Y. City.
Miller, Chas. E., 97-101 Reade St., N. Y. City.
Monnier Auto and Cycle Supply Co., Detroit, Mich.
Post & Lester Co. (The), 20 Sargeant St., Hartford, Conn
Roby, The Sidney B. Co., 208 South Ave., Rochester, N. Y

Jobbers (Cycles and Sundries).

Ball-Fintze Co. (The), Newark, Ohio.
Beckley-Ralston Co., 178 Lake St., Chicago, Ill.
Boston Cycle and Sundry Co., 48 Hanover St., Boston Mass.
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill. "Excelsior," "Lakoto" and "Cactus."
Grady, J. W. & Co., 16 Austin St., Worcester, Mass. ("Hudson" Bicycles.)
Kasner, A. H., 152 Church St., N. Y. City.
Manhattan Storage Co., 42-44 Cortlandt St., N. Y. City.
Manufacturers' Supply Co., 418 Arch St., Phila., Pa.
N. Y. Sporting Goods Co., 17 Warren St., N. Y. City "Powhatan," "Nassau," "Sportsman," "Regiment" and "First Preferred" tires.
Nock, Geo. W., 126 N. 4th St., Phila., Pa. "Nock."
Post & Lester Co. (The), 20 Sargeant St., Hartford, Conn.
Willis, E. J. Co., 10 Park Place, N. Y. City.
Wooster, Wm. Bicycle Co., 10 Barclay St., N. Y. City.

Jobbers (Motor Cycle Parts and Accessories).

Coleman, H. P., 66 Stanhope St., Boston, Mass.
Widmayer, F. B., 2312 Broadway, N. Y. City.

Jobbers (Tools and Machinery).

Garvin Machine Co., Spring and Varick Sts., N. Y. City.

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Toledo Metal Wheel Co., Toledo, Ohio.

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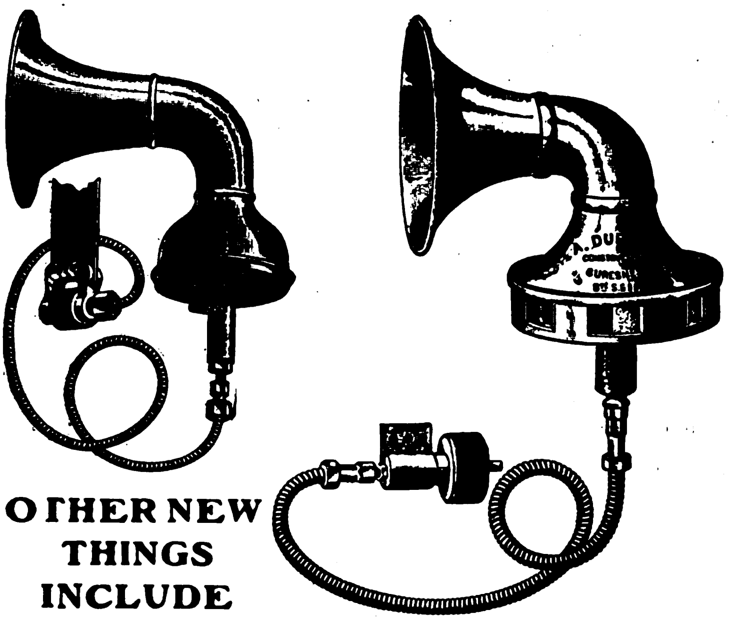

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Lamps (Automobile).

American Lamp Co., 83-85 Randolph St., Detroit, Mich.
American Lamp Works, 66 W. 43rd St., New York City.
Angiulli, Luigi, 180-182 Centre St., New York City.
Atwood Mfg. Co., Amesbury, Mass.
Automobile Supply Mfg. Co., 320 Driggs Ave., Brooklyn, N. Y.
Badger Brass Mfg. Co. (The), Kenosha, Wis. "Solar."
Chicago Battery Co., Michigan Ave., and 14th St., Chicago, Ill. "Duro."
Columbus Brass Co., 43-45 N. 4th St., Columbus, Ohio.
Corcoran Bros. Co., 712 Reading Road, Cincinnati, Ohio.
Cowles, C. & Co., Water and Chestnut Sts., New Haven, Conn.
Dayton Electrical Mfg. Co. (The), 609-612 Reibold Bldg., Dayton, Ohio. (Combined lighting and igniting outfits.)
Dayton Mfg. Co., Dayton, Ohio. "Avery Lite."
Dubois Searchlight Co., 220 Broadway, N. Y. City.
Eco Mfg. Co., 53 State St., Boston, Mass.
Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit Mich.
Elbridge Electrical Mfg. Co., Elbridge, N. Y.
General Electric Co., Schenectady, N. Y.
Gray & Davis, Amesbury, Mass.
Gray, Peter & Sons, 88-90 Union St., Boston, Mass.
Ham, C. T. Mfg. Co., Rochester, N. Y. "Ham," "Cold Blast."
Hine-Watt Mfg. Co., 69 Wabash Ave., Chicago, Ill.
Hofacker, G., 121 E. 13th St., New York City.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Motor Car Equipment Co. (The), 55 Warren St., N. Y. City.
Newark Coach Lamp Mfg. Co., 152-154 Summit St., Newark, N. J.
New York Coach and Auto Lamp Co., 798 10th Ave., New York City.
Ohio Electric Works, 76 and 78 Ellen St., Cleveland, O.
Post & Lester Co. (The), 20 Sargeant St., Hartford, Conn.
Richmond, Indiana, Mfg. Co., Richmond, Ind.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."
Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J.
Scoville & Peck Co., 15 Wooster St., New Haven, Conn. "Peck."
Standard Carriage Lamp Co., 43-49 S. Canal St., Chicago, "Standard & Reliance."
Storage Battery Supply Co. (The), 239 E. 27th St., New York City.
Twentieth Century Mfg. Co., 19 Warren St., New York City. "Twentieth Century."
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. "Vesta."

Lamps (Boat).

American Lamp Co., 83-85 Randolph St., Detroit, Mich.
Badger Brass Mfg. Co. (The), Kenosha, Wis. "Solar.".
Carlisle & Finch Co., 229 E. Clinton Ave., Cincinnati, Ohio. (Complete outfit.)
Dubois Searchlight Co., 220 Broadway, N. Y. City.
Eco Mfg. Co., 53 State St., Boston, Mass.
Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit Mich.
Gray, Peter & Sons, 88-90 Union St., Boston, Mass.
Marine Launch Igniting and Lighting Co., The, Watkins, N. Y.
Motor Car Equipment Co. (The), 55 Warren St., N. Y. City.
Porter's, Wm. Sons Co., 17-27 Vandewater St., N. Y. City.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. (Neverout.)
Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J.
Scoville & Peck Co., 15 Wooster St., New Haven, Conn.
Standard Carriage Lamp Co., 43-49 S. Canal St., Chicago, Ill.
Storage Battery Supply Co. (The), 239 E. 27th St., New York City.
Twentieth Century Mfg. Co., 19 Warren St., New York City. "Twentieth Century."

Lamps (Cycle).

Badger Brass Mfg. Co., Kenosha, Wis. ("Solar.")
Bridgeport Brass Co., 253 Broadway, N. Y. City.
Hine-Watt Mfg. Co., 69 Wabash Ave., Chicago, Ill. ("Columbia.")
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. (Light Weight and "Breckinridge.")
Ohio Electric Works, 76 and 78 Ellen St., Cleveland, Ohio. "Ohio."
Rose Mfg. Co., 910 Arch St., Phila., Pa. ("Neverout.")
Twentieth Century Mfg. Co., 19 Warren St., N. Y. City. ("Twentieth Century.")

Lamp Brackets (Automobile).

Auto Brass and Aluminum Co., Flint, Mich.
Automobile Cover and Top Mfg. Co., 148 N. 56th St., New York City.
Badger Brass Mfg. Co. (The), Kenosha, Wis.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Gray & Davis, Amesbury, Mass.
Hine-Watt Mfg. Co., 69 Wabash St., Chicago, Ill.
Imperial Brass Mfg. Co. (The), 245-47 Jefferson St., Chicago, Ill.
Motor Car Supply Co. (The), 1427 Michigan Ave., Chicago, Ill.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.
Smith, Jos. N. & Co., 4th and Porter Sts., Detroit, Mich.

Lamp Brackets (Boat).

Badger Brass Mfg. Co., Kenosha, Wis.

Lamp Brackets (Cycle).

Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. ("Forsyth.")
Nelson, A. Mfg. Co., 67-69 S. Canal St., Chicago, Ill. (Extension.)
Nock, Geo. W., 126 N. 4th St., Phila., Pa. ("Keystone.")
Theim Mfg. Co. (The), Columbia Heights, Minn.

Lamp Covers.

Gilbert Mfg. Co., New Haven, Conn.
London Auto Supply Co., 1229-31 Michigan Ave., Chicago, Ill.
Nathan Novelty Mfg. Co., 86-90 Reade St., N. Y. City.
Vehicle Apron and Hood Co., 198 E. Rich St., Columbus, Ohio.
Wiley, The Wm. H. Co., Box 78, Hartford, Conn.

Lamp Parts and Accessories (Auto).

Acetylene Gas Illuminating Co., 105 Walker St., N. Y. City. (Burners.)
American Lava Co., Chattanooga, Tenn. (Burners.)
Auto Improvement Co., The, 304 Hudson St., N. Y. City. (Gas tanks.) "Ever Ready."
Dietz, R. E. Co., 35 Laight St., N. Y. City. (Burners for oil lamps.)
Kirchberger, M. & Co., 50 Warren St., N. Y. City. (Burners.)
Prest-O-Lite Gas Tank Co. (The), Indianapolis, Ind., Box 484. (Gas tanks.)
Scheidig, John & Co., 50 Maiden Lane, N. Y. City.
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. (Storage batteries.)

Lamp Parts (Cycle).

Acetylene Gas Illuminating Co., 105 Walker St., N. Y. City. (Burners.)
American Lava Co., Chattanooga, Tenn. (Burners.)
Cole, G. W. Co., 143 Broadway, N. Y. City. (Wicks.)
Kirchberger & Co., M., 50 Warren St., N. Y. City. (Burners.)

Lavatories.

Sands, A. B. Sons Co., 242 Water St., N. Y. City. (Folding.)

Levers.

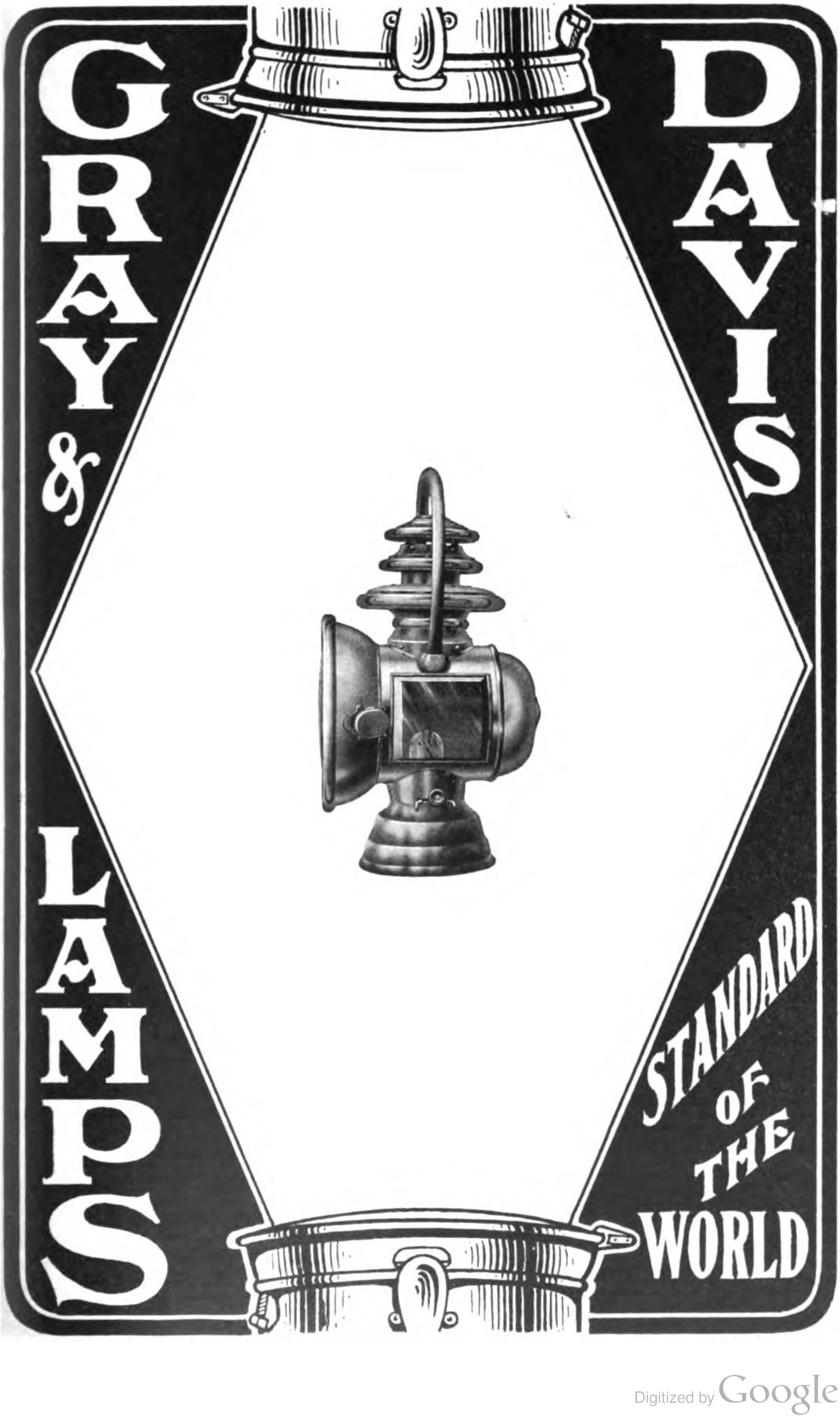
Cramp, The Wm. & Sons, S. and E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
Garage Equipment Co., 10 31st St., Milwaukee, Wis. (Brake levers.)
Garford Co. (The), Elyria, Ohio.
Lee Mfg. Co. (The), South Park, Port Huron, Mich. (On contract.)
Reading Auto Co., 26 and 28 S. 5th St., Reading, Pa. ("Victor" brake levers.)
Spacke, The F. W. Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.

License Tags.

Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Boyle, John & Co., 112-114 Duane St., N. Y. City. (And lamp numbers.)
Dentzeau, Geo., 161 Grand St., N. Y. City.
Fine, Horace E., Trenton, N. J.
Lighthouse, Chas. F. & Co., 1769 Broadway, N. Y. City.
McKinnon Dash Co., Amherst St., Buffalo, N. Y.
Mesinger, H. & F. Mfg. Co., 1801 First Ave., N. Y. City.
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Post & Lester Co. (The), Hartford, Conn.
U. S. Dash and Fender Co., 125 E. 42nd St., N. Y. City.

Locks (Cycle).

Nock, Geo. W., 126 N. 4th St., Phila., Pa. ("Little Gem" sprocket.)


GRAY
&
LAMPS
DAVIS
STANDARD
OF
THE
WORLD

BUYERS' GUIDE—Continued

Lubricators.

American Lubricator Co., Detroit, Mich.
Auto. Brass and Aluminum Co., Flint, Mich.
Charter Specialty Mfg. Co., 59 Clark St., Chicago, Ill.
Cook's, Adam, Sons, 313 West St., N. Y. City.
Crescent Mfg. Co., Scottdale, Pa.
Detroit Lubricator Co., Hodges Bldg., Detroit, Mich.
Dodge Lubricator Co. (The), 36 Columbus St., Boston, Mass. (National Sales Corporation, 256 Broadway, N. Y. Factory Sales Mgr.)
Essex, G. B., Brass Co., 480 Franklin St., Detroit, Mich.
Greene, Tweed & Co., 17 Murray St., N. Y. City. ("Pony Rochester.")
Hatcher Auto-Parts Co. (The), 136 The Viaduct, Cleveland, Ohio.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, O.
Kinsey Mfg. Co., Dayton, Ohio.
Lee Mfg. Co. (The), South Park, Port Huron, Mich. (Made on contract.)
Lipman, Carl E. L., Beloit, Wis.
Locke Regulator Co., Salem, Mass.
Lunkenheimer Co. (The), Cincinnati, Ohio.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Madison-Kipp Lubricator Co., Madison, Wis. "Valveless."
Michigan Lubricator Co., 667-671 Beaubien St., Detroit, Mich.
Muncie Auto. Parts Co., Muncie, Ind.
National Oil Heating Co., Melrose, Mass.
National Sewing Machine Co., Belvidere, Ill.
Pedersen, J. T., 636-644 First Ave., N. Y. City.
Powell, Wm. Co., 2525 Spring Grove Ave., Cincinnati, O.
Rajah Auto-Supply Co., 140 Washington St., N. Y. City.
Runyen, James & Sons, Redkey, Ind.
Sherman, H. B. Mfg. Co., Battle Creek, Mich.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Standard Gauge Mfg. Co., Syracuse, N. Y.
Steel Ball Co. (The), 832 Austin Ave., Chicago, Ill.
Wilkinson, W. H. & Co., West Medway, Mass.
Winkley Co. (The), P. O. Box 243, Detroit, Mich.

Luggage Carriers (Cycle).

Cole, G. W. Co., 143 Broadway, N. Y. City.
Coolidge, C. S., Troy, Ohio.
Duck Brake Co., 335 Broadway, N. Y. City.
Goodrich B. F. Co., Akron, Ohio. (Rubber..)
Goodyear Tire and Rubber Co., Akron, Ohio. (Rubber.)
Michigan Automobile Co., Ltd., Kalamazoo, Mich.
Young, Orlando W., 174 Frelinghuysen Ave., Newark, N. J.

Luggage Carriers (Auto).

Automobile Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City.
Coolidge, C. S., Troy, Ohio.
Detroit Carriage Co., Detroit, Mich.
Maine Motor Carriage Co., 44 Plum St., Portland, Me. (Folding.)
Motor Car Supply Co. (The), 1427 Michigan Ave., Chicago, Ill.

Machinery.

American Die and Tool Co., Reading, Pa. "Reamers."
American Drop Forging and Tool Co., Wayland, N. Y. (Emery wheel dresser and cutter.)
Beaman & Smith Co. (The), Providence, R. I.
Bullard Machine Tool Co., Bridgeport, Conn. (Boring and turning mills and turret machines.)
Burtt Mfg. Co., 124-130 N. Edward St., Kalamazoo, Mich. (Tire setting machine.)
Century Cement Machine Co., 181 W. Main St., Rochester, N. Y. (For making hollow cement building blocks.)
Cleveland Automatic Machine Co., Cleveland, Ohio. (Turret machine.)
Cleveland Pneumatic Tool Co., Cleveland, Ohio. (Pneumatic riveting machines.)
Colburn Machine Tool Co., Franklin, Pa. (Boring and turning mills.)
Essex Mfg. and Supply Co., Newark, N. J. (Curved cotter pin extractor.)
Field, Chas. H. Co., 230 Chestnut St., Providence, R. I. (Grinding and polishing machines.)
Franklin Portable Crane and Hoist Co., Franklin, Pa. (Portable crane and hoist.)
Gisholt Machine Co., 1325 Washington Ave., Madison Wis. (Boring mills.)
Henry & Wright Mfg. Co., Hartford, Conn. (Filing machines.)
Hill, Clarke & Co., 156 Oliver St., Boston, Mass. (Machine tools.)
La Pointe Machine Tool Co., 32 Atlantic Ave., Boston, Mass. (Keyseat broaching machine and reamers.)
M. & M. Mfg. Co., Akron, Ohio. (Buffing wheels.)
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill. (Bolt cutters, boring mills, centering machines, cut-off machines, keyseaters, pipe machines, slotters and tapping machines.)
National Machine Co., 111-135 Sheldon St., Hartford, Conn. (Centering and tapping machines.)
Nicholls, William S., 253 Broadway, N. Y. City. (Portable hoists.)
Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y. (To order.)
Northern Electrical Mfg. Co., Madison, Wis. (Electric motors for driving machinery.)
Novelty Tufting Mach. Co., 192 Michigan Ave., Chicago, Ill. (Cushion and back tufting.)
Pedrick & Smith, Church Lane and P. & R. Ry., Germantown, Phila., Pa. (For bending pipe cold.)
Porter, H. K., 6 Ashland St., Everett, Mass. (Bolt clipper.)
Pratt & Whitney Co., 111 Broadway, N. Y. City. (Wheel and frame assemblers.)
Potter & Johnston Machine Co., Pawtucket, R. I. (Chucking and turning.)
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City. (Horizontal and vertical boring machines.)
Standard Tool Co., Cleveland, Ohio. (Milling cutters, reamers, emery wheel dressers.)
Wells, F. E. & Son Co., Greenfield, Mass. (Tapping machines.)
Whiton, D. E. Mach. Co., New London, Conn. (Centering machines.)

CHUCKS.

Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Standard Tool Co., Cleveland, Ohio.
Whitney Mfg. Co., Hartford, Conn. "Presto."
Whiton, D. E., Mach. Co., New London, Conn.

DRILLS.

American Die and Tool Co., Reading, Pa.
American Tool Works Co. (The), 6th and Eggleston Ave., Cincinnati, Ohio. (Upright and radial.)
Barnes, W. F. & John Co., 204 Ruby St., Rockford, Ill. (Upright.)
Barr, H. G. & Co., Worcester, Mass. (Sensitive.)
Carroll-Jamieson Machine Tool Co. (The), Batavia, Ohio.
Chicago Pneumatic Tool Co., Fisher Bldg., Chicago, Ill. (Electric.)
Cleveland Twist Drill Co., Cleveland, Ohio.
Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Motor driven breast drills.)
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Hisey-Wolf Machine Co., Cincinnati, Ohio. (Portable electric.)
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill.
National Machine Co., 111-135 Sheldon St., Hartford, Conn.
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City. (Upright and radial.)
Francis Reed Co., 43 Hammond St., Worcester, Mass.
Standard Tool Co., Cleveland, Ohio. (Twist.)

FORMING MACHINES.

American Die and Tool Co., Reading, Pa.
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Pratt & Whitney Co., 111 Broadway, N. Y. City.

GEAR CUTTERS.

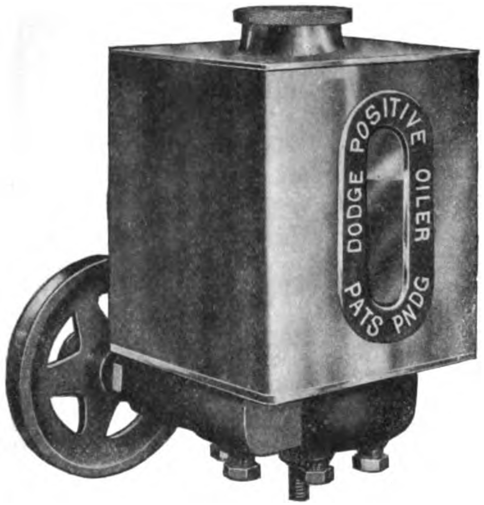
Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., L. B. 196, Tolland, Conn. (Milling cutters.)
Fellows Bear Shaper Co. (The), Springfield, Vt. (Gear shaper.)
Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J.
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Marshall & Huschart Machinery Co., 62-74 S. Canal St., Chicago, Ill.
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Whiton, D. E. Machine Co., New London, Conn.

GRINDERS.

Adams Co. (The), Dubuque, Iowa.
Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.
Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Motor driven.)
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Gay, E. T., 74 Main St., Southbridge, Mass. (Lawn mower.)
Gisholt Machine Co., 1325 Washington Ave., Madison, Wis. (Tool.)
Goodnow, L. H., Foundry Co., Fitchburg, Mass. (Universal, surface, plain and emery.)
Heald Machine Co., Worcester, Mass. (Piston ring, cylinder and drill.)

DODGE Positive Force Feed Oilers

FOR AUTOMOBILES, STATIONARY AND MARINE ENGINES

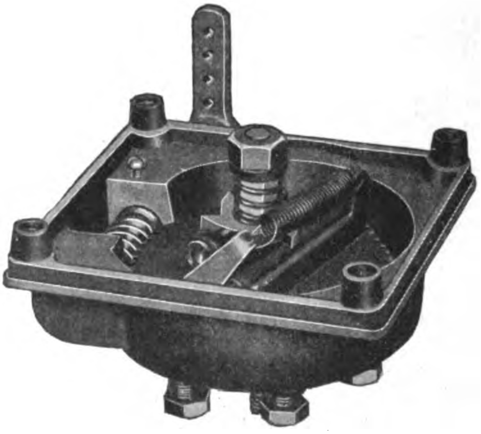


STYLE A

Absolutely automatic, require no attention. They are not eye servants, but can be absolutely relied upon in all weather and under all conditions. The greater the speed, the more oil is delivered to the parts, and when you stop, the flow of oil stops. No valves to open or close. **No blue smoke,** consequently no waste of oil.

Either pulley, ratchet or sprocket drive. Made in polished brass or iron.

Send for catalogue and price list.



Base of Style A, Showing Mechanical Construction

MANUFACTURED BY

Dodge Lubricator Company

36 Columbus Avenue, Boston, Mass.

National Sales Corporation, 256 Broadway, New York, N. Y.
Factory Sales Managers

BUYERS' GUIDE—Continued

Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Hisey-Wolf Machine Co., Cincinnati, Ohio. (Portable electric.)
Landis Tool Co., Waynesboro, Pa. (Universal, crank and internal.)
Luther Bros. Co., N. Milwaukee, Wis. (Carborundrum.)
Marshall & Huschart Machinery Co., 62-74 S. Canal St., Chicago, Ill.
National Machine Co., 111-135 Sheldon St., Hartford, Conn.
New England Cycle Supply Co., Keene, N. H. (Emery.)
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.
Rivett Lathe Mfg. Co., Brighton, Boston, Mass.
Vitrified Wheel Works, Westfield, Mass. (Carborundrum wheels.)
Wells, F. E. & Son Co., Greenfield, Mass.
Whitney Mfg. Co., Hartford, Conn.
Zacharias, C. R., Asbury Park, N. J. (Skate and lawn mower.)

HUB MACHINES.

Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Pratt & Whitney Co., 111 Broadway, N. Y. City.

LATHES.

The American Tool Works Co., 6th and Eggleston Ave., Cincinnati, Ohio.
W. F. & John Barnes Co., 204 Ruby St., Rockford, Ill. (Foot Power.)
The Carroll-Jamieson Machine Tool Co., Batavia, Ohio.
Fitchburg Machine Works, Fitchburg, Mass.
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
E. L. Gay, 74 Main St., Southbridge, Mass.
Gisholt Machine Co., 1325 Wash. Ave., Madison, Wis. (Turret.)
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill.
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.
Rivett Lathe Mfg. Co., Brighton, Boston, Mass.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Springfield Machine Tool Co., Springfield, Ohio.
Von Wyck Mach. Tool Co., C. H. & D. R. R. and Elmore St., Cincinnati, Ohio.
F. E. Wells & Son Co., Greenfield, Mass.

MILLING MACHINES.

The Adams Co., Dubuque, Iowa.
American Die and Tool Co., Reading, Pa.
Brown & Sharpe Mfg. Co., Providence, R. I.
R. M. Clough, L. B. 196, Tolland, Conn. (Vertical.)
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Marshall & Huschart Machinery Co., 62-74 S. Canal St., Chicago, Ill.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.
Rivett Lathe Mfg. Co., Brighton, Boston, Mass.
Whitney Mfg. Co., Hartford, Conn.

PLANERS.

The American Tool Works Co., 6th and Eggleston Ave., Cincinnati, Ohio.
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.

POLISHING MACHINES.

Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Motor Driven Buffing Outfit.)

PRESSES.

Barnes, W. F., & John Co., 204 Ruby St., Rockford, Ill. (Arbor.)
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J. (Drill.)
Henry & Wright Mfg. Co., Hartford, Conn. (Drill.)
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill.
National Machine Co., 111-135 Sheldon St., Hartford, Conn. (Sensitive Drill and Multiple Spindle.)
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.

RIM MAKING MACHINERY.

The Defiance Machine Works, Defiance, Ohio.

TUBE CUTTERS.

Pratt & Whitney Co., 111 Broadway, N. Y. City.
Wells, F. E. & Son, Co., Greenfield, Mass.

SCREW MACHINES.

Brown & Sharpe Mfg. Co., Providence, R. I.
Garvin Machine Co., Spring and Varick Sts., N. Y. City.
Hartford Machine Screw Co., Hartford, Conn.
Marshall & Huschart Machinery Co., 62-74 S. Canal St., Chicago, Ill.
The National Acme Manufacturing Co., Cleveland, Ohio.
Prentiss Tool and Supply Co., 115 Liberty St., N. Y. City.
Wells, F. E., & Son Co., Greenfield, Mass.

SHAPERS.

The American Tool Works Co., 6th and Eggleston Ave., Cincinnati, Ohio.
Gould and Eberhardt, 99 N. J. R. R. Ave., Newark, N. J "High Duty."
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Marshall & Huschart Mach. Co., 62-74 S. Canal St., Chicago, Ill.

SPOKE MAKING MACHINERY.

The Defiance Machine Works, Defiance, Ohio.

WHEEL MAKING MACHINERY.

The Defiance Machine Works, Defiance, Ohio.

Machinery Parts

Bown Machine Co., Ltd., 92 Jefferson Ave., Battle Creek Mich. (Tool Holders.)
L. T. Gauss, 222 Mill St., Rochester, N. Y. (Dies, Jigs Milling Fixtures, Vise Jaws, Special Cutters, Etc.)

Machine Work.

Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
Bown Machine Co., Ltd., 92 Jefferson Ave., S. Battle Creek, Mich.
Case Mfg. Co., The, Columbus, Ohio.
Cassard, Hamilton, Baltimore, Md.
Columbus Screw and Machine Co., The, 244 Kaiser St. Columbus, Ohio. (Screw.)
Essex Engineering Co., 54 Nassau St., Newark, N. J.
Globe Brass Co., Detroit, Mich.
International Brass and Elec. Co., 76 Beekman St., N. Y. City.
Lee Mfg. Co., The, South Park, Port Huron, Mich. (Gear Cutting.)
Leland, Wm. H., & Co., Worcester, Mass. (On Crank Shafts.)
Manufacturers' Foundry Co., Waterbury, Conn.
Meadowbrook Cycle Co., 137-41 Jackson St., Hempstead, L. I., N. Y.
Meisel Press and Mfg. Co., 944 Dorchester Ave., Boston, Mass.
Muncie Auto. Parts Co., Muncie, Ind.
National Cycle Mfg. Co., Bay City, Mich.
Peninsular Milled Screw Co., 751-55 Bellevue Ave., Detroit, Mich.
Providence Engineering Works, 521 S. Main St., Providence, R. I.
Redington, F. B., & Co., 107 S. Sangamon St., Chicago, Ill.
Sittman & Pitt, State St. and Boerum Place, Brooklyn, N. Y. (Screw.)
Spacke, F. W., The, Mach. Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.

Magnetic Plugs.

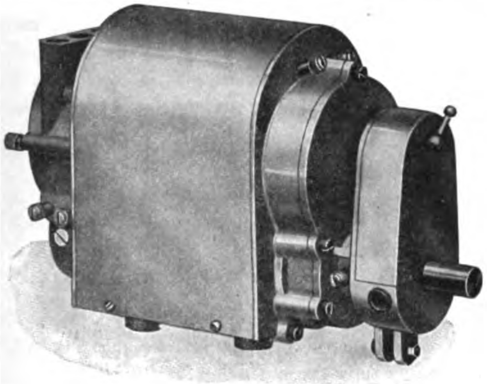
Amesbury Brass and Foundry Co., Amesbury, Mass.
The Bullock Igniter Co., Cleveland, Ohio.
Duryea Power Co., North River and Hockley Sts., Reading, Pa. "New Dur."
Primary Spark Plug Mfg. Co., 416 Commercial National Bank Bldg., Chicago, Ill.
Sprague & Carr, Fowlerville, Mich.
Zorn, W. M., 508 Sterling Ave., Cleveland, Ohio.

Magnetos.

Auto and Power Appliance Co., The, 357-359 The Arcade, Cleveland, Ohio.
Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago.
Dayton Electrical Mfg. Co., The, 609-12 Reibold Building Dayton, Ohio. "Apple."
Goodson Electric Ignition Co., 94 Point St., Providence R. I. "Goodson."
Henricks Novelty Co., 130 Capital Ave., S., Indianapolis, Ind.
Hercules Electric and Mfg. Co., 707-709 Langsdale Ave. Indianapolis, Ind.
Hewitt Motor Co., 6-10 E. 31st St., New York City.
Holley Bros. Co., 661-673 Beaubien St., Detroit, Mich.
Holtzer-Cabot Electric Co., Brookline, Boston, Mass.
Hurd & Haggin, 316 Hudson St., N. Y. City.
The Knoblock-Heideman Co., South Bend, Ind.
Mosler, A. R., & Co., 1679 Broadway, N. Y. City.
Perfection Magneto Co., Anderson, Ind. "Perfection."
Remy Electric Co., 1st and Sherman Sts., Anderson, Ind
Ruprecht Igniter & Electrical Co., 967 Cedar Ave., Cleveland, Ohio.
Splitdorf, C. F., 23 Vandewater St., N. Y. City.
Standard Motor Construction Co., 172-180 Whiton St., Jersey City, N. J.
The Tritt Electric Co., Union City, Ind.

REMY MAGNETOS

SPECIFY MAGNETO FOR YOUR 1906 CAR.



High Tension Type H.

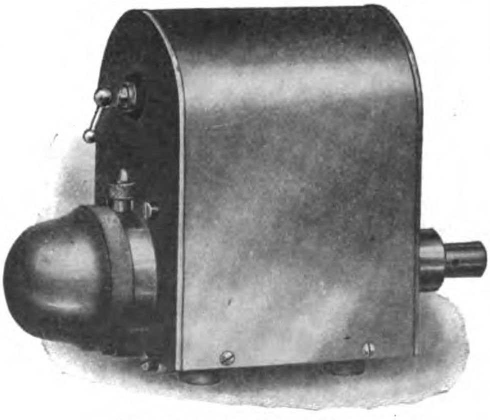
The simplest and highest grade ignition apparatus that can be used with the four cylinder automobile motor.

The electrical design is superior and the mechanical construction equal to the best foreign made apparatus and far above comparison with other American made mechanical ignition apparatus.

Is used upon more high priced 1906 American made cars than all other Magnetos and Dynamos combined.

We will exhibit at Madison Square Garden and 69th Regiment Armory Automobile Shows in New York and Chicago Automobile show.

REMY ELECTRIC CO.
732-38 Sherman St.
ANDERSON, INDIANA



Low Tension Type R.

BUYERS' GUIDE—Continued.

Manufacturers' Agents.

The Automobile Supply Co., 1339 Michigan Boulevard, Chicago, Ill. Carl E. Lipman, C. L. Altemus & Co.
Eames, Hayden, American Trust Building, Cleveland, O. Westinghouse Elec. and Mfg., Pittsburg, Pa.; Garford M'g. Co., Elyria, Ohio; Cleveland Axle Mfg. Co., Canton, Ohio; Imperial Wheel Co., Flint, Mich.; St. Mary's Wheel and Spoke Co., St. Mary's, Ohio; The Winkley Co., Detroit, Mich.
Fonda, Chas. P., Room 220, 421 Market St., San Francisco, Cal. (Lubricant, "It," "Fonda" vehicle washer, fire extinguisher.)
J. L. Gibney & Bro., 211 N. Broad St., Philadelphia, Pa. (Tires and Sundries.)
The Guarantee Tire and Bicycle Co., Indianapolis, Ind. (Tires.)
Harris, D. P., 48 Warren St., N. Y. City. Buffalo Metal Goods Co.
Hastings & Anderson, 116 Lake St., Chicago, Ill. American Wood Rim Co.; Frank Mossberg Co.; C. E. Peterlein.
Judson, The J. G., Co., 105 and 107 Chambers St., N. Y. City. Manhattan Screw and Stamping Works; Skinner & Skinner; Adwear Auto Tire Sleeve Co.; Scott Muffler Co.; Beckley Ralston Co.
Leng's, John S., Sons & Co., 93 Reade St., N. Y. City.
Miller, Chas. E., 97-101 Reade St., New York, N. Y. (Brampton Auto Chains.)
National Sales Corporation, 256 Broadway, New York, N. Y. C. A. Mezgar; Royal Battery Co.; Dodge Lubricator Co.; Conn. Telephone and Elec. Co.
New York Sporting Goods Co., 17 Warren St., New York, N. Y.
The Post & Lester Co., 20 Sargeant St., Hartford, Conn. M. & M. Mfg. Co.; Railway Appliances Co.; Stitch-in-Time Vulcanizer Co.
Chas. D. Shain, 70 Murray St., N. Y. City.
Stevens & Co., 99 Chambers St., N. Y. City. Osborne, Stephenson & Co.; A. N. Clark & Son; F. L. Ellis & Son; Leather and Brass Mfg. Co.; Springfield Hat and Cap Co.; Clark Bros. Bolt Co.; Dudley Tool Co.; A. H. Warner.
Synnestvedt Machine Co., 4117 Liberty Ave., Pittsburg, Pa. The Commercial Automobile Co., 1336 Michigan Ave., Chicago, Ill.

Marine Engines.

Alpha Motor and Machine Co., 592 N. Main St., Fall River, Mass.
American, The Gasoline Motor Co., Baldwinsville, N. Y.
Atherton, J. F., & Co., 65 S. Canal St., Chicago, Ill. "Pekin."
Atlantic, The, Co., Amesbury, Mass.
Austin Auto Co., 88-92 S. Division St., Grand Rapids, Mich.
Auto Engine Works, St. Paul, Minn.
Automatic Machine Co., The, Bridgeport, Conn.
Ayers Gasoline Engine and Auto Works, Hamilton and Bristol Sts., Saginaw, W. S., Mich.
Bachmann, The G. A., Motor Co., 3118 O'Donnell St., Baltimore, Md. "Little Wonder."
Ball Mfg. Co., 388 Pacific St., Stamford, Conn.
Barber Bros., 101 Grape St., Syracuse, N. Y.
Barker, C. L., Norwalk, Conn.
Bauers Bros., 1916-1918 Light St., Baltimore, Md.
Belcher Motor Co., Fall River, Mass.
Benton, Thos. P., & Son, La Crosse, Wis.
Blomstrom, The A. H., Motor Co., 75 Clark Ave., Detroit, Mich.
Bridgeport Motor Co., Bridgeport, Conn.
Brown-Cochran Co., The, Lorain, Ohio. "Lacy."
Brown & Johnson Mfg. Co., New Orleans, La.
Brown-Talbot Machinery Co., 438 Old South Building, Boston, Mass.
Buffalo Gasoline Motor Co., 1280-1286 Niagara St., Buffalo, N. Y.
Buffum, H. H., Co., Abington, Mass.
Camden Anchor-Rockland Mach. Co., Rockland, Me. "Knox."
Camp Engineering Co., 47 W. Lake St., Chicago, Ill.
Carlson, Chas. A., 1060 Bedford Ave., Brooklyn, N. Y.
Central City Iron Works, Stevens Point, Wis.
Chase, Yacht and Engine Co., 201 Pitman St., Providence, R. I.
Chestnut Hill, The Auto Sta., Commonwealth Ave., Newton Centre, Mass.
Clark, Edward S., 272-278 Freeport St., Boston, Mass.
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Clifton, The, Motor Works, 229 E. Clifton Ave., Cincinnati, Ohio.
Columbus, The, Screw and Mach. Co., 244 Kaiser St., Columbus, Ohio.
Continental Motor Mfg. Co., 242-244 W. Lake St., Chicago, Ill.
Cooley Mfg. Co., Waterbury, Vt.
Cornwell, The R. M., Co., 418-420 S. Salina St., Syracuse, N. Y.
Craig, James, 556 W. 34th St., N. Y. City.
Crescent Machine and Tool Co., 220-222 S. Penna. St., Indianapolis, Ind.
Cross, M., Engine Co., Detroit, Mich.
Crouch, Chas. P., & Co., 472-484 Carroll Ave., Chicago, Ill.
Cushman Motor Co., 2020-2030 N St., Lincoln, Neb.
De Mooy Bros., Cleveland, Ohio.
Denison, Julian F., 219 Water St., New Haven, Conn.
Detroit Auto-Marine Co., 66 Congress St., Detroit, Mich.
Detroit Steam Engine Co., 405 Moffat Bldg., Detroit, Mich. (Steam.)
Dieter Steam Engine Co., The, 106 Liberty St., N. Y. City. "Dieter." (Steam.)
Doman, The H. R., Co., Oshkosh, Wis.
Du Brie Motor Co., 34 Brush St., Detroit, Mich.
Duluth Gas Engine Works, Duluth, Minn.
Dunn, Walter E., 12 W. River St., Ogdensburg, N. Y.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Dutton Engineering Co., Perth Amboy, N. J.
Easternhouse Engine Co., 35 Vernon St., Taunton, Mass.
Eclipse Motor Co., Mancelona, Mich.
Electric Launch Co., The, 179 Ave A, Bayonne, N. J.
Emery, V. J., Co., Beach St., Wollaston, Mass.
Emmons, E. Gerry, Corporation, 53-61 New Ocean St., Swampscott, Mass.
Enterprise Machine Co., 1112-1120 S. Third St., Minneapolis, Minn.
Erd Motor Co., Saginaw, Mich.
Fairbanks-Grant Mfg. Co., The, 800 W. Buffalo St., Ithaca, N. Y. (Gasoline and steam.)
Fairfield Motor Co., Fairfield, Conn.
Fairmount Engineering Co., 3207 Spring Garden St., Philadelphia, Pa.
Fast Machine and Tool Works, 1061-1063 29th Ave., Milwaukee, Wis.
Fay & Bowen Engine Co., 76 Lake St., Geneva, N. Y.
Funke, A. H., 83 Chambers St., N. Y.
Gaeth Auto Works, 902-6 Pearl St., Cleveland, Ohio.
Gas Engine Power Co. and Chas. L. Seabury & Co., Morris Heights, N. Y.
Glazier & Briggs, 74-78 Sagamore St., Lynn, Mass.
Globe Iron Works Co., Menominee, Wis.
Godshalk, E. H., & Co., 23d and Hamilton Sts., Philadelphia, Pa.
Goodell, Zina, Salem, Mass. "Naumkeag."
Goodwin Motor Co., 14 Wash. St., Lynn, Mass.
Gordon, C. C., & Co., Dubuque, Iowa.
Goshen Motor Works, Goshen, Ind.
Grand Rapids Gas Engine and Yacht Co., Grand Rapids, Mich. "Monarch."
Gray & Prior Machine Co., Hartford, Conn.
Griswold Mfg. Co., The, Quincy, Mass.
Haase Motor Works, 1017 Lloyd St., Milwaukee, Wis. "Haase."
Hall Bros. Gas Engine Works, 1120 Seigle St., Philadelphia, Pa.
Harley-Davidson Motor Co., 315 37th St., Milwaukee, Wis.
Harrington-Wiard Co., Batavia, N. Y.
Hasbrouck Motor Works, New London, Conn.
Heinel, H. A., Co., Wilmington, Del.
Hercules Gas Engine Works, 603 Mission St., San Francisco, Cal.
Herschell-Spillman Co., N. Tonawanda, N. Y.
Hildreth Motor and Pump Co., 49 W. Hill St., Lansing, Mich.
Hoffman, H. L., Motor Co., 47-49 Canal St., Chicago, Ill.
Hoffman, W., Motor Works, 1253 N. Halsted St., Chicago, Ill.
Holliday Mfg. and Engineering Co., 160 Bunker St., Chicago, Ill.
Houle, A. J., 580 East St., Holyoke, Mass.
Howard, W. S., Yonkers, N. Y.
Hoyt, G. P. B., Jamaica, N. Y.
Hubbard Motor Co., Middletown, Conn.
Humphreyes, T. J., Skaneateles, N. Y.
Isham Co., The, Norwich, Conn.
Jackson, Wm., Fall River, Mass.
Jager, Chas. J., Co., 166-168 High St., Boston, Mass.
Jeffers, Warren H., 373 Canal St., New York, N. Y.
Judkins Show Case Co., E. Providence Centre, R. I.
Kahlenberg Bros., Two Rivers, Wis.
Keating, R. M., Motor Co., Middletown, Conn.
Keidel, Henry, & Co., 405 W. German St., Baltimore, Md.
Kowalsky Engine Co., Verona, Pa.
Kumberger & Vreeland, 33-35 Sullivan St., N. Y. City.
Lackawanna Mfg. Co., Newburgh, N. Y.
Lacy Bros., Lorain, Ohio.
Lake Shore Engine Works, 115 E. Wash St., Marquette, Mich.
Lamb Boat and Engine Co., Clinton, Iowa.
Lathrop, James W., & Co., Mystic, Conn.
Lawrence Machine Co., Lawrence, Mass.
Leighton, H. J., Syracuse, N. Y.
Louvet & Son, 248 Park Place, Woodhaven, N. Y. "Louvet."
Lozier Motor Co., 55th St. and Broadway, N. Y. City, N. Y.
McFadden Mfg. Co., Havana, Ill.
Mackay Engineering Co., 149 Broadway, N. Y. City, N. Y.
Mack Bros. Motor Car Co., South Allentown, Pa.
Marine Engine and Machine Co., 126 Liberty St., N. Y. City, N. Y. (Kerosene) "Secor."
Mason, Wm. H., Mt. Carmel, Ill.
Masanick Mfg. Co., 671 Atwater St., Detroit, Mich.
Maxwell & Fitch Co., The, Rome, N. Y.
Merchants' Specialty Mfg. Co., 259 Greenwich St., N. Y. City, N. Y.
Mianus Motor Co., Mianus, Conn.
Michigan Motor Co., 246 S. Front St., Grand Rapids, Mich.
Mietz, Aug., 128-138 Mott St., N. Y. (Kerosene.)
Minn. Boat and Power Works, Stillwater, Minn.
Monroe Engine Co., 45 Congress St., Boston, Mass. (Steam.)

THE MOTOR CAR EQUIPMENT CO.

MANUFACTURERS - - IMPORTERS - - DISTRIBUTORS

AUTOMOBILE ACCESSORIES

Manufacturers of
"CONTINENTAL"
AUTO LAMPS, CLOCKS
and
CALLIOPE HORNS.

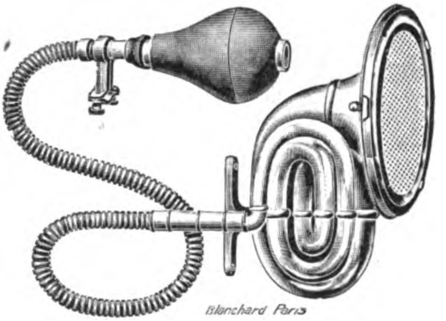
Importers of
ITALIAN CABLE
GOGGLES, SPARK PLUGS,
AMMETERS, &c.

United States Agents for
"BLANCHARD" FAMOUS
FRENCH HORNS.

Sole Export Agents for
IMPERIAL WIXON PUMPS
"WEED"
CHAIN TIRE GRIP,
"GEECEE"
DRY STORAGE BATTERY
"WEBER"
PORTABLE TURN-TABLES

"BLANCHARD"

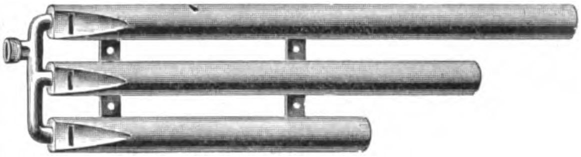
FAMOUS FRENCH HORNS



Sounds Like a Fog Horn.

21 STYLES—LATEST DESIGNS

The Continental Calliope.



The "CONTINENTAL CALLIOPE" is the most musical and powerful signal of its type yet invented, and is fully protected by letters patent No. 783,748, dated February 28, 1905, controlling the application of the exhaust from the engine as the means for blowing horns or signals of any description.

Send for new REDUCED Price List just issued

55 WARREN STREET - NEW YORK - 1645-47 BROADWAY

BUYERS' GUDE—Continued

Moore & Richards, 307 W. Willow St., Syracuse, N. Y.
Motor Car Power Equipment Co., 577 Grove St., Milwaukee, Wis. "Evinrude."
Mullins, W. H., Salem, Ohio.
Murray, W. B., 1253 Milwaukee Ave., Chicago, Ill.
Murray & Tregurtha Co., South Boston, Mass.
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
New Bedford Gas Engine Co., Inc., 10 Spring St., New Bedford, Mass.
New London Motor Co., New London, Conn.
Newport Engineering Works, 359-367 Thames St., Newport, R. I.
N. Y. Yacht, Launch and Engine Co., Morris Heights, N. Y.
Norfolk Motor Co., Wollaston, Mass.
North Chicago Machine Co., The, North Chicago, Ill.
Ofeldt, F. W., & Son, Nyack, N. Y. (Compound Vapor.)
Owen, E. F., 217 Market St., Lynn, Mass. "Swampscott."
Parker, J. J., Co., 507 Erie St., Fulton, N. Y.
Pennsylvania Iron Works, 50th St. and Lancaster Ave., Philadelphia, Pa.
Perkins Launch and Motor Co., The, Gloucester, Mass.
Phila. Boat and Engine Co., 1017 N. Front St., Philadelphia, Pa.
Phillips Motor Works, 133 La Salle St., Chicago, Ill. "Phillips Duplex."
Pierce Engine Co., The, Racine, Wis.
Progressive Mfg. Co., The, Torrington, Conn.
Pungs-Finch Auto. Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich.
Racine Boat Mfg. Co., Muskegon, Mich.
Raspberry Island Boat and Engine Co., St. Paul, Minn.
Rathbun-Lacy Co., The, 602 Segur Ave., Toledo, Ohio.
Regal Gasoline Engine Co., Coldwater, Mich.
Rhode Island Motor Co., Providence, R. I.
Rice, J. V., Jr., & Co., Bordentown, N. J.
Rochester Gas Engine Co., Driving Park Ave., Rochester, N. Y.
Royal Equipment Co., 151 Housatonic Ave., Bridgeport, Conn.
St. Paul Boat Co., State St. and Levee, St. Paul, Minn.
Sarvent Marine Engine Co., Southport and Clybourne Aves., Chicago, Ill.
Schaeffer, W. E., Ripon, Wis.
Scheppele Machine Works, Dubuque, Iowa.
Schilling, C. R., 810 N. Main St., St. Louis, Mo.
Seitz, F. A., & Co., 390 Webster Ave., L. I. City, N. Y.
Severson & Lee, 18 Lewis St., Albany, N. Y.
Smalley Motor Co., Bay City, Mich.
Smith, Geo. D., Jr., Baldwins, L. I., N. Y.
Smith & Mabley, Inc., Broadway, between 56th and 57th Sts., N. Y. City, N. Y.
Smith & Williams, Columbus, Ohio.
Sovereign Engine and Construction Co., 29 Broadway, N. Y. City, N. Y.
Spaulding Engine Co., The, St. Joseph, Mich.
Stamford Motor Co., Foundry St., Stamford, Conn.
Standard Motor Construction Co., 172-180 Whiton St., Jersey City, N. J.
Sterling Engine Co., 121 Grant St., Buffalo, N. Y.
Strelinger, Chas. A., Co., 96-110 Bates St., Detroit, Mich.
Stuart, John, Co., Wollaston, Mass.
Termatt & Monahan, River and Bay Sts., Oshkosh, Wis.
Toquet Motor Co., The, Metropolitan Bldg., N. Y. City, N. Y.
Trebert Auto. and Marine Motor Co., 407 St. Paul St., Rochester, N. Y.
Truscott Boat Mfg. Co., St. Joseph, Mich.
Tuck Petroleum Motor Co., 3d Ave. and 22d St., Brooklyn, N. Y. (Petroleum.)
Tuttle, D. M., & Co., Canastota, N. Y.
Tuttle, H. A., Mfg. Co., South Norwalk, Conn.
United Mfg. Co., 171-175 Woodbridge St., W., Detroit, Mich. "Little Grant."
United States Engine Co., The, 47 S. Main St., Oshkosh, Wis.
Universal Kerosene Engine Co., 6-10 First St., N. Y. City, N. Y. (Kerosene.)
Van Wagner, L. G., 44 White Memorial Bldg., Syracuse, N. Y.
Van Auken-Clevauc Co., Yonkers, N. Y.
Watertown Motor Co., 40 Moulton St., Watertown, N. Y.
Watkins, Frank M., Mfg. Co., 525-531 Baymiller St., Cincinnati, Ohio.
Westerfield Motor Co., 1525 Main St., Anderson, Ind.
Western Launch and Engine Works, Michigan City, Ind.
Western Motor Co., Logansport, Ind.
Winkley Engineering Co., 486 Union St., Lynn, Mass.
Wolverine Motor Works, Grand Rapids, Mich.
Yacht Gas Engine and Launch Co., Philadelphia, Pa.
Young, W. J., Machinery Co., 418 Union St., Lynn, Mass. "Essex."

Marine Glue.

Siemon & Elting, 194 Front St., N. Y. City. "Shaply."

Marine Specialties (Miscellaneous).

Atlantic Co., The, Amesbury, Mass.
Boss Mfg. Co., Atlantic, Mass. (Awning Fastener.)
Lackawanna Mfg. Co., Newburgh, N. Y.
Rice, John V., Jr., & Co., Bordentown, N. J.
Richardson Engineering Co., 36 Pearl St., Hartford, Conn. (Elec. Ignition Equipment.)
Sands, A. B., & Sons Co., 242 Water St., N. Y. City, N. Y. (Ventilator.)

Mats.

Boston Woven Hose and Rubber Co.,
Mass. (Rubber.)
Dahlstrom Metallic Door Co., Jamestown,
Diamond Rubber Co., Akron, Ohio. (Ru
Hartford Rubber Works Co., Hartford, C
Mass. Chemical Co., Walpole, Mass. (Ru
Milwaukee Rubber Works Co., Oudahy, W
Westboro Mills, Westboro, Mass. (Carpet.

Mechanical Expert

Mechanical Advisory Board, The, Chillicot

Metal Figures.

The Chandler Co., 31 Taylor St., Spring
Childs, S. D., & Co., 200 Clark St., Chica
grams.)
Horace E. Fine, Trenton, N. J. (Auto.
Lamp Numbers.)
Noonan Tool and Mach. Works, 103-105
Rome, N. Y.
Providence Aluminum Co., 460 Eddy St., P
F. H. Rees, Steel Memorial Bldg., Elmira
ograms.)

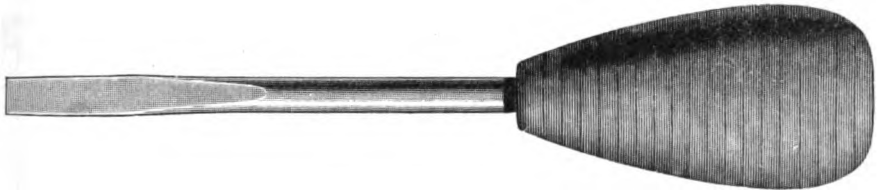
Meters (Miscellaneou

General Electrical Co., Schenectady, N. Y
Rubay Leon, 140 W. 38th St., New York
meters.) (Importer.)
Witherbee Igniter Co., 541 W. 43d St. (

Miscellaneous Articles Not Specified.

Aladdin Rubber Co., The, Akron, Ohio. (
ber.)
Allison, G. F., & Co., Utica, N. Y. (
Waste.)
Auto Equipment Co., 16 Hollywood Ave.,
J. (Specially Prepared Ground Emery.
Automatic Specialty Co., Lawyers' Building,
(Stop Watch.)
Bowser, S. F., & Co., Inc., Fort Wayn
Measuring Pumps and Tanks.)
Brewster, Nester H., East Orange, N. J.,
(Club Buttons, Badges and Cap Pins.)
Briggs, W. H., 424 Bedford Ave., Bro
("Briggs" Gasoline Syphon.)
Buffalo Specialty Co., 375-77 Ellicott St.,
("Peerless" Top Dressing Liquid Shellac
Rubber.)
Burrowes, The E. T., Co., Portland, Me.
Foot Rest and Brace.)
Chaney, A., The, Mfg. Co., Terre Haute, In
Auto Cleaner.)
Cleveland Wire Spring Co., Cleveland,
Racks.)
Dixon, Jos. Crucible Co., Jersey City, N.
Cement for Pipe Threads.)
Dover Stamping and Mfg. Co., 385 Putna
bridge, Mass. (Drip Pans, Funnels, Mea
Waste Cans.)
Dusenbury, Louis, 86-88 North St., N. Y. C
Carpets.)
Essex Mfg. and Supply Co., Newark, N. J.
Washers, "Rapidcut" Cutting Compound
Garford Co., The, Elyria, Ohio. (Distan
Brackets.)
Giddings, C. M., Rockford, Ill. (Engine V
ings.)
Ireson Leather and Export Co., 148 High
Mass. (Brake Leathers.)
Iron Clad Mfg. Co., 204 Varet St., Bro
(Steel Gasoline Tanks.)
Lester, E. F., Fayetteville, N. Y. (Alu
and Flux.)
Manlove Gate Co., 272 E. Huron St., Chica
Opening Gate.)
Manufacturers' Can Co., 432-436 Mulberry St.,
(Oil tanks.)
Miller, Horatio L., 2 Sargeant St., Worceste
Cleaner.)
Monarch Mfg. Co., 352-54 Elm St., Buffalo,
ble Paste for Bodies.)
Peninsular Milled Screw Co., 751-55 Bellev
troit, Mich. (Cones, Turnbuckles and Stee
Perfection Specialty Co., 172-80 St. Aubin
Mich. (Emergency Bandage Plaster.)
Rosenblatt, H. M., 1023-25 Vine St., Phil
(Specialties.)
Salem Chemical Co., Salem, Mass. (Waste.
Sedgwick Mach. Works, Poughkeepsie, N. Y
Hand Elevators and Dumb Waiters.)
Star Remedy Co., 583 E. 43d St., Chicag
Cream.)
Tingley, Chas. O., & Co., Rahway, N. J.
Lacquer.)
Turner Brass Works, The, Franklin and Mic
cago, Ill. ("Turner Hand Torch.")
Ulery, W. J., 9 Warren St., N. Y. City. (
Tool Kit.)
U. S. Gutta Percha Co., 1834 Mathewson St.
R. I. (Cement for Flaws in Castings.)

NEVERSLIP SCREW DRIVERS



New Idea Blade and Solid Leather Handles

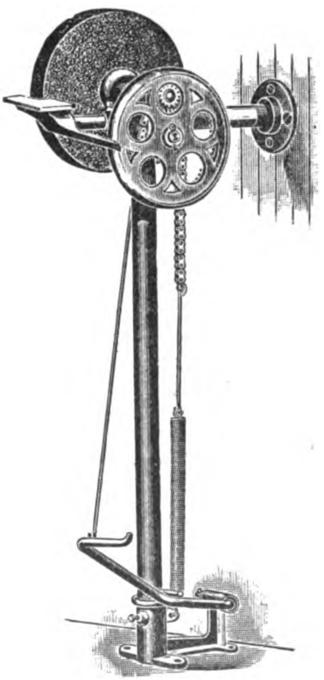
Here is a superior article in a Screw Driver that every automobile manufacturer and user ought to adopt. The blades are made from the highest grade steel, hand forged and tempered, and ground nearly concave, so that it is next to impossible for them to slip out of the screw head. The handles are of peculiar construction, being made of discs of solid leather, each one of which is treated to a powerful cement and then driven right on to the squared end of the steel. Afterward the handles are smoothly turned and burnished, affording a screw driver that is very attractive and practically indestructible. Nothing else like them on the market. Write for prices.

SUCCESS EMERY GRINDER

FOOT POWER

For Cycle and Automobile Repair Shops

This is the greatest foot power grinder on earth. It is just the thing for cycle and automobile repair shops and will pay for itself over and over again. When set up it stands 4 feet high; the upright or standard is made of ¾ inch tubing, and is very solid and strong. The emery wheel is of the highest grade, and is 8 inches in diameter by 1¼ inch face. It is supplied with a suitable and substantial rest. It has no belt to slip, loosen or break; neither has it lead teeth to wear out and bind. The movement of the foot operates a roller ratchet, which sends the emery wheel spinning easily at 3000 revolutions per minute. The machine screws to the floor and wall and is quickly and easily set up. Write for prices.



BUFFALO SPECIALTY CO.

BUFFALO, N. Y.

BUYERS' GUIDE—Continued

Wells, F. E., Son & So., Greenfield, Mass. (Screws and Taper Pins.)
Whitney Mfg. Co., The, Hartford, Conn. (Keys and Cutters for Woodruff Patent Keying System.)
Winkley Co., The, Detroit, Mich., Box No. 243. (Dowel Pins, Auto.)

Motor Boats (Gasoline).

Alco Vapor Launch Co., Newark, N. J.
Amer. and British Mfg. Co., The, 74 Broadway, N. Y. City.
Amer. Gasoline Motor Co., Baldwinsville, N. Y.
Amer. Motor Boat Wks., Grand Rapids, Mich., Box 94.
Atlantic Co., The, Amesbury, Mass.
Auto Boat Co., 1 Madison Ave., N. Y. City.
Bird-Sutton Boat Co., 509 Water St., Saugatuck, Mich.
Blomstrom, The A. H., Motor Co., 75 Clark St., Detroit, Mich.
Bridgeport Motor Co., Bridgeport, Conn.
Brooks Boat Mfg. Co., 1113 Wash. St., Bay City, Mich.
Brown & Johnson Mfg. Co., New Orleans, La.
Bryan, E. C., 38 Walnut St., Wyandotte, Mich.
Burgess and Packard, Board of Trade Bldg., Boston, Mass.
Camden Anchor-Rockland Mach. Co., Rockland, Me.
Chadakoin Boat Co., Jamestown, N. Y.
Cleveland Motor Boat Co., 1055 Detroit St., Cleveland, O.
Conover & White, Allenhurst, N. J.
Cooley Mfg. Co., Waterbury, Vt.
Darien Launch Works, The, Five Mile River, Conn.
De Mooy Bros., Cleveland, Ohio.
Detroit Boat Co., Detroit, Mich. (Wood.)
Du Brie Motor Co., 34 Bush St., Detroit, Mich.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Dutton Engineering Co., Perth Amboy, N. J.
Eclipse Boat Co., Manitowoc, Wis.
Edson Boat Co., The, Skaneateles, N. Y., Box No. 226.
Electric Launch Co., The, 179 Ave. A, Bayonne, N. J.
Emmons, E. Gerry, Corporation, 53-61 New Ocean St., Swampscott, Mass.
Erd Motor Co., Saginaw, Mich.
Fairbanks-Grant Mfg. Co., The, 800 W. Buffalo St., Ithaca, N. Y.
Fay & Bowen Engine Co., 76 Lake St., Geneva, N. Y.
Fraser Hollow Spar and Boat Co., Greenpoint, L. I., N. Y.
Globe Iron Works Co., Menominee, Wis.
Godshalk, E. H., & Co., 23d and Hamilton Sts., Philadelphia, Pa.
Goshen Motor Works, Goshen, Ind.
Gulliford, G. A., 303 Eastern Ave., Lynn, Mass.
Hansen, A., City Island, N. Y.
Hampton Roads Boat Building Co., Newport News, Va.
Hasbrouck Motor Works, Inc., New London, Conn.
Higgins & Gifford Boat Building Co., Gloucester, Mass.
Hoffman, W., Motor Works, 1253 N. Halsted St., Chicago, Ill.
Hubbard Motor Co., Middletown, Conn.
Hunter-Weckler Boat Co., The, McHenry, Ill.
Huntington Mfg. Co., The, New Rochelle, N. Y.
Johnson, Theo. A., Co., Somerset St., Portland, Me.
Jones & La Borde Launch Co., Oshkosh, Wis.
Judkins Show Case Co., E. Providence Centre, R. I.
Keating, The R. M., Motor Co., Middletown, Conn.
King Folding Canvas Boat Co., Kalamozoo, Mich. (Folding.)
Kowalsky Engine Co., Verona, Pa.
Lake Shore Engine Works, 115 E. Wash. St., Marquette, Mich.
Lamb Boat and Engine Co., Clinton, Iowa.
Leyare Boat Works, Ogdensburg, N. Y.
Lozier Motor Co., 55th St. and Broadway, N. Y. City.
Madison Boat Co., Madison, Wis.
Martin, Fred. W., Waukegan, Ill.
Mather, The C. B., Corp., Rowley, Mass.
Matheson Motor Car Co., Wilkes-Barre, Pa.
Matinecock Launch and Power Co., Oyster Bay, L. I., N. Y.
Mich. Steel Boat Co., The, Detroit, Mich. (Steel.)
Milton Point Shipyard, Rye, N. Y.
Minn. Boat and Power Works, Stillwater, Minn.
Moore Boat Works, Wayzata, Minn.
Morse Dry Dock and Repair Co., The, foot of 56th St., Brooklyn, N. Y.
Mullins, W. H., Salem, Ohio. (Pressed Steel.)
Murray & Tregurtha Co., South Boston, Mass.
Neumeister, Fred. P., Rockford, Ill.
New York Kerosene Oil Engine Co., College Point, L. I., N. Y.
Nock, F. S., East Greenwich, R. I.
Osborn, W. R., Croton-on-Hudson, N. Y.
Outing Boat Co., Riverdale, Ill.
Owen, E. F., 217 Market St., Lynn, Mass.
Pearson Boat Construction Co., Duluth, Minn.
Peo, Leon L., & Co., Cape Vincent, N. Y.
Perkins Launch and Motor Co., The, Gloucester, Mass.
Phila. Boat and Engine Co., 1017 N. Front St., Philadelphia, Pa.
Pierce Engine Co., The, Racine, Wis.
Pouliot Boat and Power Co., The, Sandusky, Ohio.
Pungs-Finch Auto Gas Engine Co., Detroit, Mich.
Putnam, R. H., 3 Walnut St., Springfield, Mass.
Racine Boat and Canoe Co., Racine Junction, Wis.
Racine Boat and Mfg. Co., Muskegon, Mich.
Raspberry Island Boat and Engine Co., St. Paul, Minn.
Reardon, Maurice F., Canarsie Shore, Brooklyn, N. Y.
Rigby, H. T., Canarsie, N. Y.
Rippley Hardware Co., Grafton, Ill. (Galvanized Steel.)
Ruddock, W. W., Boat and Oar Wks., 12 W. 141st St., N. Y. City.
St. Joseph Boat Mfg. Co., St. Joseph, Mich.
St. Paul Boat Co., State St. and Levee, St. Paul, Minn.
Schaeffer, W. E., Ripon, Wis.
Seaman Motor and Launch Co., Branchport, N. J.
The Sheldon O. Co., Boston, Mass.
Smith & Mabley, Inc., Broadway, between 56th and 57th Sts., N. Y. City.
Solheim's Launch Works, Great Kills, Staten Island, N. Y.
Stamford Motor Co., Foundry St., Stamford, Conn.
Standard Motor Construction Co., 172-180 Whiton St., Jersey City, N. J.
Stearns & McKay, Marblehead, Mass.
Stone, Thomas, Boat Building Co., 536 Humphrey St., Swampscott, Mass.
Stuart, John C., Wollaston, Mass.
Submerged Exhaust Co., 149 Water St., Newbury Port, Mass.
Superior Launch Co., 184 North St., Kalamazoo, Mich.
Susquehanna Marine Works Co., Havre de Grace, Md.
Toppan Boat Mfg. Co., 9 Haverhill St., Boston, Mass.
Truscott Boat Mfg. Co., St. Joseph, Mich.
Tuttle, D. M. & Co., Canastota, N. Y.
Weller's, Hiram, Sons, Trenton, N. J.
Western Launch and Engine Works, Michigan City, Ind.
Western Launch Yards, West 210th and Emerson Sts., N. Y. City.
Williams-Whittelsey Co., foot Steinway Ave., Long Island City, N. Y.
Wolverine Motor Works, Grand Rapids, Mich.
Wyckoff Bros., Inc., Clinton, Conn.
Yacht Gas Engine and Launch Co., Philadelphia, Pa.

Motor Boats (Electric).

Madison Boat Co., Madison, Wis.
Truscott Boat Mfg. Co., St. Joseph, Mich.

Motor Boats (Steam).

Madison Boat Co., Madison, Wis.
Nock, F. S., East Greenwich, R. I.
Osborn, W. R., Croton-on-Hudson, N. Y.
Truscott Boat Mfg. Co., St. Joseph, Mich.
Williams-Whittlesley Co., foot Steinway Ave., L. I. City N. Y.

Motor Cycles.

American Motor Co., 705 Centre St., Brockton, Mass. ("Marsh.")
Armac Motor Co., 472 Carroll Ave., Chicago, Ill.
Consolidated Mfg. Co., Toledo, Ohio. ("Yale-California."
Crouch Motor Co., Stoneham, Mass. ("Crouch.")
Curtiss, G. H., Mfg. Co., Hammondsport, N. Y.
Fowler-Manson-Sherman Cycle Mfg. Co., 45-47 Fulton St. Chicago, Ill. ("Fowler-Manson & Sherman.")
Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo.
Great Western Mfg. Co., La Porte, Ind.
Harley-Davidson Motor Co., 315 37th St., Milwaukee, Wis.
Hendee Mfg. Co., 216 Worthington St., Springfield, Mass. ("Indian.")
Hoffman, W., Motor Works, 1253 N. Halsted St., Chicago, Ill.
Leader Automobile Co., The, 2442 Lisbon Ave., Milwaukee, Wis.
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Mayo Damper Co., 355 Walnut St., Pottstown, Pa.
Meadowbrook Cycle Co., 137-41 Jackson St., Hempstead, L. I., N. Y. ("Meadowbrook.")
Merkel Motor Co., Layton Park, Milwaukee, Wis. ("Merkel.")
Miami Cycle and Mfg. Co., Grand Ave., Middletown, O.
Mitchell Motor Car Co., Racine, Wis. ("Mitchell.")
Motorcycle Equipment and Sup. Co., Buffalo, N. Y. ("Erie.")
Pope Mfg. Co., Chicago, Ill.
Pope Mfg. Co., Hartford, Conn. ("Columbia," "Cleveland," "Tribune," "Crawford."
Reading Standard Cycle Mfg. Co., Reading, Pa. ("Thoroughbred.")
Reliance Motor Cycle Co., Addison, N. Y. ("Reliance."
Suddard, Wm. A., 10 Bellevue Ave., Providence, R. I.
Thomas Auto-Bi Co., 1443 Niagara St., Buffalo, N. Y. ("Thomas Auto-Bi.")
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul Minn. ("Wagner.")

Motor Cycle Parts.

Aurora Automatic Mach. Co., Aurora, Ill. ("Thor.")
Geer, Harry R., Co., 1017 Pine St., St. Louis, Mo.
Hart Mfg. Co., 370 Atlantic Ave., Boston, Mass. (Pulleys.)
Leader Automobile Co., The, 2442 Lisbon Ave., Milwaukee, Wis.

The

Mest

Complete

Superb

Luxurious

Line of

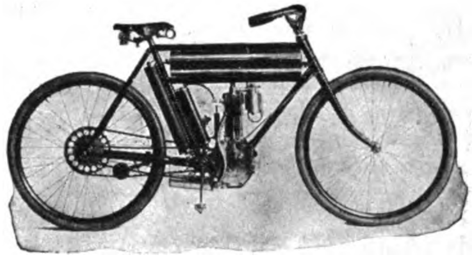
Moter

Cycles

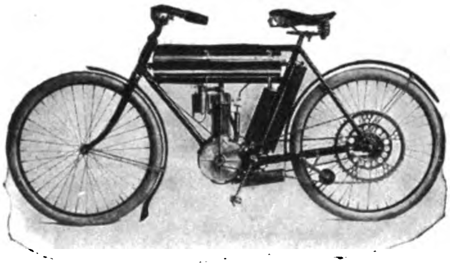
in the

World

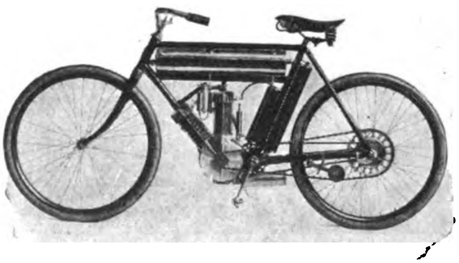
Marsh
Model D
$150



Metz
$210



Tourist
$225



Double
Cylinder
$275

Tricars and
Tandem
Attachment

AMERICAN MOTOR CO.

BROCKTON, MASS.

BUYER'S GUIDE—Continued

Motor Cycle Parts (Continued).

Mayo Damper Co., 355 Walnut St., Pottstown, Pa. (Aluminum Belt Pulley, Rear.)
Merkel Motor Co., Layton Park, Milwaukee, Wis. (Rear Pulley.)
Suddard, Wm. A., 10 Bellevue Ave., Providence, R. I. (Two Speed Hub.)
Widmayer, F. B., 2312 Broadway, N. Y. City.

Mountings (Automobile).

Atwood Mfg. Co., Amesbury, Mass. (Metal.)
Auto Brass and Aluminum Co., Flint, Mich.
Auto Top and Specialty Co., Broadway and 63d St., N. Y. City. (Rails.)
Columbus Brass Co., 43 N. 4th St., Columbus, Ohio. (Dash and Foot Rails.)
Cowles, C., & Co., Water and Chestnut Sts., New Haven, Conn.
Dahlstrom Metallic Door Co., Jamestown, N. Y. (Light Sheet Steel Mouldings.)
English & Mersick Co., New Haven, Conn.
Kinsey Mfg. Co., Dayton, Ohio. (Brass Moulding for Steps, Battery and Tool Boxes.)
Murdock, Jas., 116 Opera Place, Cincinnati, O. (Metal.)
Pittsburg Reduction Co., The, Pittsburg, Pa.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich. (Brass and Nickled Rails.)
Ritter Mfg. Co., Detroit, Mich. (Brass.)
Smith, Jos. N., & Co., 4th and Porter Sts., Detroit, Mich. (Brass and Nickel Rails, Tonneau Door Handles and Hinges.)
Woodruff, The Walter W., & Sons Co., Mt. Carmel, Conn.

Mountings (Boat).

Mud Guards (Auto).

(See "Fenders.")

Midland Metal Co., Inc., 1427-33 Catharine St., Philadelphia, Pa. (Brass Deck Rails.)
Pullman Mfg. Co., Rochester, N. Y. (Sash Balance and Spring Door Holder and Garment Hanger.)

Mud Guards (Cycle).

American Wood Rim Co., Onaway, Mich.

Mud Guard Attachments.

Clark, A. N., & Son, Plainville, Conn.
Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y.

Mufflers.

A-Z Co., The, 462 Eleventh Ave., N. Y. City.
Auto & Power Appliance Co., 357-359 The Arcade, Cleveland, Ohio.
Baldwin Chain and Mfg. Co., Dept. B, 31 Hermon St., Worcester, Mass.
Bates, F. E., & Co., Northfield, Minn. ("Bates.")
Bowen Motor Co., 92 Baynes St., Buffalo, N. Y.
Bradford Motor Co., Bradford, Pa.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y. ("Brennan.")
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.
Byrne-Kingston & Co., Kokomo, Ind.
Champion Mfg. Co., 9-15 Alling St., Newark, N. J. ("Champion.")
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw and Mach. Co., The, 244 Kaiser St., Columbus, Ohio.
Crouch, Chas. P., & Co., 472-84 Carroll Ave., Chicago, Ill.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Fonda, Charles P., Room 220, 421 Market St., San Francisco, Cal.
Gray-Hawley Mfg. Co., 605-09 Fort St., W., Detroit, Mich. Cycle.)
Gray-Hawley Mfg. Co., 605-09 Fort St., W. Detroit, Mich.
Hammar, H., Mfg. Co., 215-17 E. Lake St., Chicago, Ill.
Hayes, The, Mfg. Co., 825-45 Maybury Grand Ave., Detroit, Mich.
Kells, W. J., Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio.
Knoblock-Heideman Mfg. Co., The, South Bend, Ind.
Loomis Autocar Co., Westfield, Mass. (Auto and Marine.)
McClure & Buchner, 911 S. Homan Ave., Chicago, Ill.
Mayo Damper Co., 355 Walnut St., Pottstown, Pa.
Milwaukee Motor Co., 615 Clybourn St., Milwaukee, Wis.
Motor and Mfg. Works Co., The, 107-13 N. Albany St., Ithaca, N. Y.
Murray, W. B., 1253 Milwaukee Ave., Chicago, Ill.
Neustadt Auto & Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Powell Mfg. Co., Utica, N. Y.
Northway Motor and Mfg. Co., Maybury Grand and R. R., Detroit, Mich.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.
Ross and Kramer, 5607 S. Halsted St., Chicago, Ill.
Runyen, Jas., & Son, Redkey, Ind.
Smith, D. B., & Co., Utica, N. Y. (Also marine.)
Sun Stove Co., 1305 Bellevue Ave., Detroit, M
Thermo Electric Co., The, Room 1039, 25 Broa City. (Combined Muffler and Current Gen
Turner Brass Works, The, Franklin and Mic cago, Ill.
Uncas Specialty Co., The, 21-37 Shipping S Conn.
Weeber, C. T., Mfg. Co., 255 Sherman St., A
Weiss, Louis T., 286-90 Graham St., Brooklyn
Westerfield Motor Co., 1525 Main St., Ande
Western Motor Co., Logansport, Ind.

Muffler Cut Out Valve

Garage Equipment Co., 10 31st St., Milwaul
Indian Motor Cycle Co., 258 Columbus A Mass. (For Motor Cycles.)
Noonan Tool and Mach. Works, 103-5 Dominick N. Y.
Powell Mfg. Co., Utica, N. Y.

Name Plates.

The Chandler Co., 31 Taylor St., Springfield
Childs, S. D., & Co., 200 Clark St., Chicag
Cowles, C., & Co., Water and Chestnut Sts., Conn.
Meyercord Co., (The), Chamber of Commerce cago, Ill.
Murdock, James, Jr., 116 Opera Place, Cincin
Turner Brass Works (The), Franklin and M Chicago, Ill.
Wadsworth Engraving Co., Springfield, Ohio.
Walter, N. C. & Sons, 194 William St., N. Y

Naval Architects.

Barney, Morgan, 29 Broadway, N. Y.
Burgess & Packard, Board of Trade Bldg., B
Cary, Smith & Ferris, 90 Wall St., N. Y. Cit
Fargusson, M., 11 Broadway, N. Y. City.
Gielow, Henry J., 50 Broadway, N. Y. City.
Haddock, R. M., 31 Clinton Place, New Roch
Hansen, A., City Island, N. Y.
Martin, Fred. W., Waukegan, Ill.
Nock, F. S., East Greenwich, R. I.
Payne, J. W., Alexandria Bay, N. Y.
Small Bros., 112 Water St., Boston, Mass.
Wyckoff Bros., Inc., Clinton, Conn.
[illegible]

Non-Fluid Oils.

N. Y. & N. J. Lubricant Co., 14 Church St.,

Non-Freezing Compoun

Auto Accessories Co., 99 Mueller Ave., Clevel
Automobile Equipment Co., 251 Jefferson Av Mich.
Carbondale Chemical Co., Carbondale, Pa. Chloride.)
Holmes-Schmidt Motor Co., The, 1502 Mich. cago, Ill.
Kalbfleisch, Frank H., Co., 31-35 Burling Slip,
Owen Chemical Co., 45 Vincent St., Cleve ("No-Mor Auto Freeze.")
Rhodes, Jas. H., & Co., 117 E. Kinzie St., Ch

Nuts and Bolts.

Clark, A. N., & Son, Plainville, Conn.
Columbia Nut and Bolt Co., Bridgeport, Conn bia." (Lock Nut.)
Corbin Screw Corp., New Britain, Conn.
Detroit Screw Works, Detroit, Mich. (Cap Screws, Taper Pins and Castle Nuts.)
Harris, E. T., 531-545 W. 15th St., Chicago, Il
Judd & Leland Mfg. Co., Clifton Springs, N.
The National-Acme Mfg. Co., Cleveland, C screws, set screws, special milled work f bar.)
Nelson, A., Mfg. Co., 67-69 S. Canal St., Chic
Peninsular Milled Screw Co., 751-755 Bellevue troit, Mich.
The Progressive Mfg. Co., Torrington, Conn. screws, threaded wire rivets and custom w
Sittman & Pith, Stahl St. and Boerum Place N. Y. (Set and cap screws.)
Stevens & Co., 99 Chambers St., N. Y. City.
Walker & Ehrman Mfg. Co., 129-133 W. St., Chicago, Ill. (Set and cap screws, turned bolts.)

Odometers.

Bullard, J. H., Springfield, Mass. (Speedomete and clock combined.)
Jones, Jos. W., 127 W. 32d St., N. Y. City. (
Lipman, Carl E. L., Beloit, Wis.
Loring, E. J., Somerville, Mass. (Combined ters and odometers.)
McGiehan Mfg. Co., 137 W. 32d St., N. Y. Cit
Motor Car Specialty Co., 143 E. State St., Tre (Combination speed meter, odometer and c
Rollins Mfg. Co., Park Sq. Motor Mart, Bo (Combined speedometers and odometers.)

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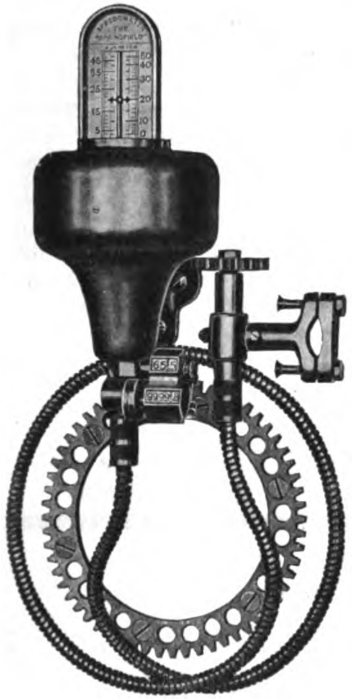
THE "SPRINGFIELD"

AT LAST A THOROUGHLY RELIABLE SPEED INDICATOR AT A MODERATE PRICE.



Aside from its assistance in complying with speed laws and the requirements of public safety, there is no questioning the satisfaction, the real fascination of knowing the speed at which your Touring Car is going and there is no more satisfactory way of knowing than by having a "Springfield" combination Speedometer and Odometer on your dashboard.

No instrument at any cost will tell you more or tell it with more accuracy.

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An exclusive feature of this instrument is the steady movement of the pointer. No jolts can divert it from its true position.

Its accurate indication of speed from one mile to the capacity of the dial is guaranteed.

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Another exclusive feature is the safety device on our Universal pinion-attaching Bracket. It will not only adjust up or down, out or in and pivot both ways so as to fit to the steering knuckle of any American-built car, but if the pinion should be thrown out of mesh with the gear by the lodging of any foreign substance, it will automatically return to the correct pitch line as soon as the gear clears itself.

For any sized wheel with jacketed flexible shaft. Correct length for any make of car.

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50 Mile Speedometer without Odometer . .	**25.00**
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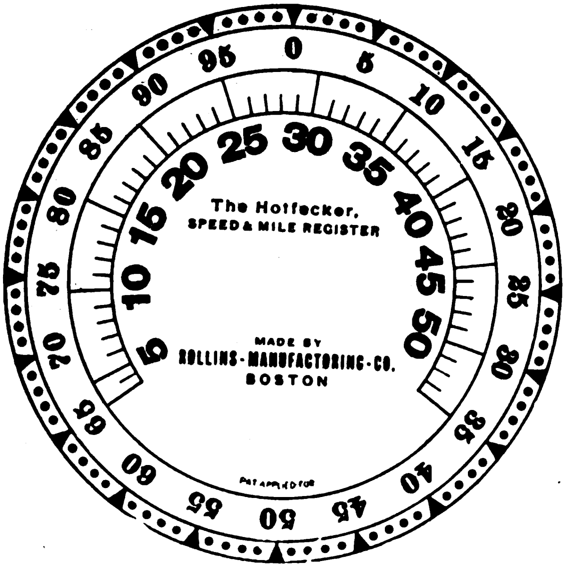

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They are constructed upon correct mechanical principles, of the best materials, by skilled workmen, and are guaranteed to work perfectly and to develop the actual speed and distance travelled.

The case is made of brass, and is highly polished and fixed to the dash permanently by means of screws. All the arbors and pinions have ball bearings.

Send for booklet and price list.

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PARK SQUARE MOTOR-MART, - - BOSTON, MASS.

BUYER'S GUIDE—Continned.

ODOMETERS—Continued.

Smith, R. H., Mfg. Co., Springfield, Mass. (Combined speedometer and odometer.)
Veeder Mfg. Co., Sargeant and Garden Sts., Hartford, Conn. ("Veeder.")
Wheelock Motor Car Clock Co., Tremont Bldg., Boston, Mass. (Odometer and speedometer combined "Wheelock.")
Wood Speedometer Co., 106 Sudbury St., Boston, Mass.

Oils.

(See also Cylinder Oil.)

Allerton Oil and Grease Co., 78 Broad St., N. Y. City.
Baum's Castorine Co., Rome, N. Y.
Borne-Scrymser Co., 135 Front St., N. Y. City. "Colonial."
Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.
Columbia Lubricants Co., 78 Broad St., N. Y. City.
Cook's, Adam, Sons, 313 West St., New York, N. Y.
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill. "Aladdin."
Germania Oil Co., 32 Broadway, N. Y. City.
Harris, A. W., Oil Co., 326 S. Water St., Providence, R. I.
Haws, Geo. A., 73 Pine St., N. Y. City.
Hollingshead, R. M., & Co., Camden, N. J.
Hughes Anti-Friction Co., 8 Sherman St., Charlestown, Mass.
Hulbert, C., & Co., 115 N. Second St., Philadelphia, Pa.
Kellogg, E. H., & Co., 243-244 South St., New York City.
Millers, Wm. P., Sons, 100 Greenpoint Ave., Brooklyn, N. Y.
Musliner, Joseph I., & Co., 204-206 Maiden Lane, N. Y. City.
Nansen Co., Lock Box No. 20, Elizabeth, N. J. "Visco-Mobile."
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio.
N. Y. and N. J. Lubricant Co., 14-16 Church St., N. Y. City. "Non-Fluid."
Nye, Wm. F., New Bedford, Mass.
Penn Petroleum Co., 117 N. 2d St., Philadelphia, Pa.
Wm. C. Robinson & Son Co., 336-342 North St., Baltimore, Md. "Autoline."
Wilkinson, W. H., & Co., West Medway, Mass.
Salem Chemical and Supply Co., Salem, Mass.
Speare's, The Alden, Sons Co., 369 Atlantic Ave., Boston, Mass.
Swan & Fincke Co., 151 Maiden Lane, N. Y. City.
Vacuum Oil Co., 29 Broadway, N. Y. City.
White & Bagley Co., Worcester, Mass. "Oilzum."
Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

Oil Cans (Automobile).

Akron Mfg. Co., Akron, Ohio.
Deverall Perfection Mfg. Co., Johnson Place, near Coney Island Ave., Brooklyn, N. Y.
Dover Stamping and Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Maple City Mfg. Co., Monmouth, Ill.
Mosher, M. E., 32 N. St. Paul St., Rochester, N. Y.
Smith, S. W., Keithsburg, Ill. "Cannon."

Oil Cans (Cycle).

Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.

Oil Cups (Automobile).

American Lubricator Co., Detroit, Mich.
Bowen Mfg. Co., Canal St., Auburn, N. Y.
Crescent Mfg. Co., Scottdale, Pa.
Duryea Power Co., North River and Hockley Sts., Reading, Pa.
Lunkenheimer Co., The, Cincinnati, O.
Michigan Lubricator Co., 661-71 Beaubien St., Detroit, Mich.
Powell, Wm., Co., 2525-2531 Spring Grove Ave., Cincinnati, Ohio.
Sherman, H. B., Mfg. Co., Battle Creek, Mich.
Star Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass.
Tucker, W. W. & C. F., 302 Asylum St., Hartford, Conn.

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OILS & GREASES.

Of the TWENTY cars entered in the W. K. Vanderbilt, Jr., Cup Race, SIXTEEN, INCLUDING THE WINNER, used

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In return you will receive a handsomely bound copy of **The Auto Owner.**

BUYER'S GUIDE—Continued

Oil Cups (Cycle).

Aurora Automatic Machinery Co., Aurora, Ills.
Bay State Stamping Co., 380 Chandler St., Worcester, Mass. (Machinery.)
Detroit Lubricator Co., Hodges Bldg., Detroit, Mich.
Essex, G. B., Brass Co., 480 Franklin St., Detroit, Mich.
Lunkenheimer Co., The Cincinnati, Ohio.
Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Winkley Co., The, Detroit, Mich., P. O. Box No. 243. ("Winkley.")

Oil Guns.

(See "Lubricant Injectors.")

Oil Hole Covers.

Bay State Stamping Co., 380 Chandler St., Worcester, Mass. (Machinery.)
Bowen Mfg. Co., Canal St., Auburn, N. Y. (Auto.)
Bown Machine Co., Ltd., 92 Jefferson St., South Battle Creek, Mich.
Tucker, W. W., & C. F., 302 Asylum St., Hartford, Conn.
Winkley Co., The, P. O. Box 243, Detroit, Mich. (Auto.)

Oil Storage Outfits.

Bowser, S. T., & Co., Inc., Fort Wayne, Ind.
Hydraulic Oil Storage and Distributing Co., 1002 Penobscot Bldg., Detroit, Mich.

Owners' and Dealers' Lists.

Motor Directories Co., 106 Fulton St., N. Y. City.
Owner Publishing Co., 617 Chestnut St., St. Louis, Mo.

Paints.

Acme White Lead and Color Co., Detroit, Mich. ("Acme.")
Brooks, Clarence, & Co., 249-77 Chestnut St., Newark, N. J.
Detroit White Lead Wks., 532 Milwaukee Ave., Detroit, Mich.
Ditzler Color Co., 18-24 Balto. Ave., W., Detroit, Mich.
Masury, Jno. W., & Son, P. O. Box No. 1012, N. Y. City.
Murphy Varnish Co., Newark, N. J.
Sherwin-Williams Co., The, 104 Canal St., Cleveland, O.
Smith, Edw., & Co., 45 Broadway, N. Y. City.
Speare's, The, Alden Sons Co., 369 Atlantic Ave., Boston, Mass.
Standard Varnish Wks., 29 Broadway, N. Y. City
Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City. (Acid Proof.)
U. S. Gutta Percha Paint Co., 1834 Mathewson St., Providence, R. I. (For machinery.)
Valentine and Company, 257 Broadway, N. Y. City.
Wadsworth Howland & Co., 84 Washington St., Boston, Mass.
Willey, C. A., & Co., Hunter's Point, N. Y.

Panels (Body).

Central Mfg. Co., Connersville, Ind.

Patterns.

Acme Steel and Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.
Balkwill Pattern Wks., 1301 St. Clair St., Cleveland, O.
Buhl Malleable Co., Wight and Adair Sts., Detroit, Mich.
Essex Engineering Co., 54 Nassau St., Newark, N. J.
Hartford Pattern and Model Co., 120-24 Allyn St., Hartford, Conn.
Judd, Wm. B., 31 Canal St., Waterbury, Conn.
Manufacturers' Foundry Co., Waterbury, Conn.
Meisel Press and Mfg. Co., 944-48 Dorchester Ave., Boston, Mass.

Patterns (Boat).

Brooks Boat Mfg. Co., Bay City, Mich.
Modern Boat & Pattern Co., The, Wharf 7, Bay City, Mich.

Pedals (Auto).

Garage Equipment Co., 10 31st St., Milwaukee, Wis.
Turner, The, Brass Wks., Franklin and Michigan Sts. Chicago, Ill. ("Turner" Ratchet Treadle.)

Pedals (Cycle).

Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
Corbin Screw Corporation, New Britain, Conn. ("Ramsey.")
Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. ("Forsyth.")
Standard Co., The, Torrington, Conn. ("B. G. I.," "Star" &"Bridgeport.")

Pipe Fittings.

Lunkenheimer Co., The, Cincinnati, Ohio.
Sherman, H. B., Mfg. Co., Battle Creek, Mich.
Simmons, John, Co., 104-10 Centre St., N. Y. City.
Walworth Mfg. Co., 128 Federal St., Boston, Mass.

Platers.

Ideal Plating Co., 3 Appleton St., Boston, Mass.

Pliers.

American Drop Forging & Tool Co., Wayland, N. Y. (Combination.)
Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
Hjorth, Wm., & Co., Jamestown, N. Y.
Kilbourn & Bishop Co., New Haven, Conn.
Noonan Tool and Machine Wks., 103-105 Dominick St., Rome, N. Y.
Utica Drop Forge & Tool Co., 75 Genesee St., Utica, N. Y.

Polishes (Metal).

American Metal Polish Co., 89 Winslow Ave., W. Somerville, Mass.
Buffalo Specialty Co., 375 Elicott St., Buffalo, N. Y. ("Metaline.")
Armstrong & Co., Kalamazoo, Mich. ("Monarch.")
Cole, G. W., Co., 143 Broadway, N. Y. City. ("R. K." & "3 in 1.")
Columbia Lubricants Co., of N. Y., 78 Broad St., N. Y. City.
Cross, W. H., 18-20 Franklin St., Brooklyn, N. Y.
Edmonds, J., Wesley & Son, 216 Frankklin St., N. Y. City. (Electric.)
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ills. ("Famous.")

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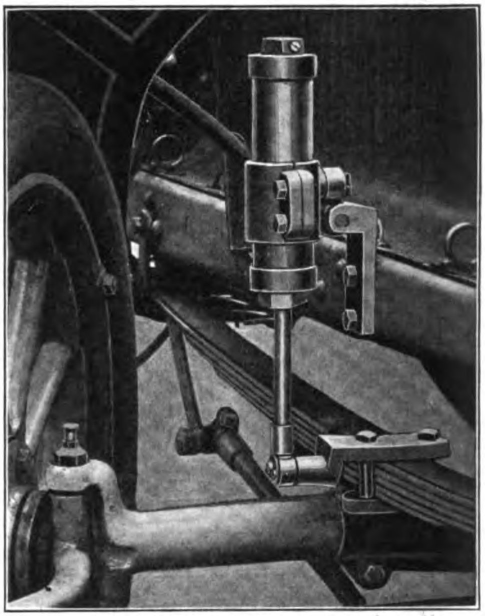
Is the most elastic substance known. The

Perfection Air Cushion

(Made in Baltimore)

Is the most resilient shock absorber ever made.



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This double acting cushion absorbs and dissipates every shock received while riding over rough or uneven surfaces.

No violent recoil of springs after obstruction is passed; every movement of the body of the automobile is eased on a cushion of air.

By reducing the vibration, it prevents lost traction, thus increasing your speed, and relieves strains on all parts of the automobile.

It permits of the use of lighter and more flexible springs—a point worthy of consideration.

THE PERFECTION AIR CUSHION requires no re-adjusting—it is of few parts, can be easily applied to any car.

Fully guaranteed.

Prices, for cars under 1400 lbs:

Bronze, $55.00 Steel, $45.00

Cars over 1400 lbs.:

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Specify the Perfection Air Cushion for your 1906 model.

For particulars write.

Call to see us at the Automobile Show, New York. Room 10, 69th Regiment Armory.

The

Sheddan Manufacturing Co.

140 W. Fayette Street, Baltimore, Md.

BUYERS' GUIDE—Continued

Fairchild, M. H., & Bro., 199 Michigan St., Chicago, Ills.
Forbes, B. P., 74 Franklin St., Cleveland, O.
Harris, A. W., Oil Co., 326 Water St., Providence, R. I.
Hoffman, Geo., Wm. E., Wash. St., Indianapolis, Ind.
Hollingshead, R. M., Co., Camden, N. J.
Jewel Mfg. Co., 341 Franklin St., Chicago, Ill.
Lord, F. T. Polish Co., 422 Broadway, Cambridge, Mass.
Lustre Chemical Co., 1303 Michigan Ave., Chicago, Ill. ("Lustre.")
Magie Bros., 9-11 N. Canal St., Chicago, Ill.
Mexican Mfg. Co., Wichita, Kans. ("Venus.")
Mooney, A. J., Co., 361 Ninth Ave., N. Y. City.
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio.
Newbern, The S. C. Co., 505 Quarry St., Phila., Pa.
New Jersey Paint Wks., Jersey City, N. J.
Raimes & Co., 50 Ferry St., N. Y. City.
Rath Mfg. Co., The, 1023-5 N. 3rd St., Phila., Pa.
Sherwin-Williams Co., The, 104 Canal St., Cleveland, Ohio.
Smith, Jos. N. & Co., Fourth and Porter Sts., Detroit, Mich. ("C. & A.")
Solarine Co., 136 Liberty St., N. Y. City. ("Solarine.")
Speare's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass.
Utility Co., The, 236 Greenwich St., N. Y. City.
Young, Orlando W., 174-80 Frelinghuysen Ave., Newark, N. J.

Polishes (Wood).

Armstrong & Co., Kalamazoo, Mich.
Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.
Cole, G. W. Co., 143 Broadway, N. Y. City.
Ditzler Color Co., 18-24 Balto. Ave., W. Detroit, Mich.
Harvie Drug Co., 153 Maiden Lane, N. Y. City.
Jewel Mfg. Co., 341 Franklin St., Chicago, Ill.
Lustre Chemical Co., 1303 Mich. Ave., Chicago, Ill.
Mexican Mfg. Co., Wichita, Kans. ("Opunca.")
Mooney, A. J., Co., 361 Ninth Ave., N. Y. City.
Rath Mfg. Co., The, 1023-5 N. 3rd St., Phila., Pa.
Smith, Jos. N. & Co., Fourth and Porter Sts., Detroit, Mich. ("Ye New Era.")

Portable Electric Lights.

America Electrical Novelty and Mfg. Co., Spring, Hudson and Vandam St., New York City.
Chicago Battery Co., Michigan Ave. and 14th St., Chicago, Ill.
Ohio Electric Works, 76-78 Ellen St., Cleveland, O. "Ohio."
Roche, Wm., Dry Battery Co., 52-54 Park Place, New York City.

Propellers.

Barber Bos., 101 Grape St., Syracuse, N. Y.
Benton, Thos. P. & Son, La Crosse, Wis.
Camden Anchor-Rockland Mach. Co., Rockland, Me.
Continental Motor Mfg. Co., 242-44 W. Lake St., Chicago, Ill.
Cushman Motor Co., 2020-2030 N St., Lincoln, Neb.
Duluth Gas Engine Works, Duluth, Minn.
Fairbanks-Grant, The, Mfg. Co., 800 W. Buffalo St., Ithaca, N. Y.
Harley-Davidson Motor Co., 315-17 37th St., Milwaukee, Wis.
Holliday Mfg. and Engineering Co., 160 Bunker St., Chicago, Ill.
Houle, A. J., 580 East St., Holyoke, Mass.
Hub Motor Co. (The), 34 Beach St., Boston, Mass.
Jager, Chas. J., 166-68 High St., Boston, Mass.
McFarland, The, Foundry and Machine Works, Trenton, N. J. "Harthan."
Marine Hardware Co., Peabody, Mass. (Geyer.)
Michigan Motor Co., 246 Front St., Grand Rapids, Mich.
Norwalk Brass Co., Norwalk, Conn.
Ross, Chas. E. & W. H. Rodman, 17 State St., N. Y. City.
Sarvent Marine Engine Co., Southport and Clybourn Aves., Chicago, Ill.
Spaulding, The Engine Co., St. Joseph, Mich.
Sterling Engine Co., 121 Grant St., Buffalo, N. Y.
Wolverine Motor Works, Grand Rapids, Mich.
Yacht Gas Engine and Yacht Co., Phila, Pa.

Propeller Shafts.

Garford Co., The, Elyria, Ohio.

Publications.

Audel, Theo., & Co., 63 5th Ave., N. Y. City. (Homan's "Self Propelled Vehicles.")
Mendenhall, C. S., 512 Race St., Cincinnati, Ohio. (Maps.)
Phoenix Automobile Supply Co., 3939 Olive St., St. Louis, Mo.
Rockwood Mfg. Co., Indianapolis, Ind.
Survey Map Co., 41 Lafayette Place, N. Y. City. (Maps.)

Pumps (Air for Steam Autos).

Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Grout Bros. Automobile Co., Orange, Mass.
Locke Regulator Co., Salem, Mass.
Ofeldt, F. W. & Son, Nyack, N. Y.

Pumps (Circulation).

Auto. Brass and Aluminum Co., Flint, Mich.
Auto. & Power Appliance Co., The, 357-359 The Arcade, Cleveland, Ohio.
Biederman C., 1555 Knox St., Cincinnati, Ohio.
Byrne, Kingston & Co., Kokomo, Ind.
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Continental Engine Co., cor. Kinsbury and Huron Sts., Chicago, Ill.
Essex, G. B., Brass Co., 480-83 Franklin St., Detroit, Mich.
Fast Machine and Tool Wks., 1061-63 29th Ave., Milwaukee, Wis.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, O.
Imperial Brass Mfg. Co., The, 245-247 S. Jefferson St., Chicago, Ill.
Lebanon Motor Co., Lebanon, Pa.
Lee Mfg. Co., The, South Park, Port Huron, Mich. (On contract.)
Lipman, Carl E. L., Beloit, Wis.
Lobee Pump and Machine Co., 142-152 Terrace St., Buffalo, N. Y.
Locke Regulator Co., Salem, Mass.
Loomis Autocar Co., Westfield, Mass.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Milwaukee Auto. Eng. and Supply Co., 706 Winnebago St., Milwaukee, Wis.
Milwaukee Motor Co., 615 Clybourn St., Milwaukee, Wis.
Minnesota Boat and Power Works, Stillwater Minn. "Schmidt."
Motor Car Power Equipment Co., 577 Grove St., Milwaukee, Wis.
Motor Car Supply Co., 1427 Michigan Ave., Chicago, Ill. "Turtle."
Muncie Auto. Parts Co., Muncie, Ind.
Murray, W. B., 1253 Milwaukee Ave., Chicago, Ill.
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
N. Y. Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.
Northway Motor and Mfg. Co., Maybury Grand and G. T. R. R., Detroit, Mich.
Ross & Kramer, 5807 S. Halsted St., Chicago, Ill.
Seitz, F. A. & Co., 390 Webster Ave., L. I. City, N. Y.
Sommer Motor Co., Box 138, Detroit, Mich.
Westerfield Motor Co., 1525 Main St., Anderson, Ind.
Western Motor Co., Logansport, Ind.

Pumps (Cycle Tire).

Bride, Wm. J. & Co., Reading, Mass. ("Austin," also for motor cycles.)
Bridgeport Brass Co., 253 Broadway, N. Y. City.
Cleveland Faucet Co., Cleveland, Ohio.
Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. ("Kellogg," "Cyclone," "Tornado," "Bonham," etc.)
Leather and Brass Mfg. Co., 22-4 Water St., Auburn, N. Y.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Stevens & Co., 99 Chambers St., N. Y. City.
Ultra Pump and Power Co., Auburn, N. Y. ("Ultra.")

Pumps (Fuel).

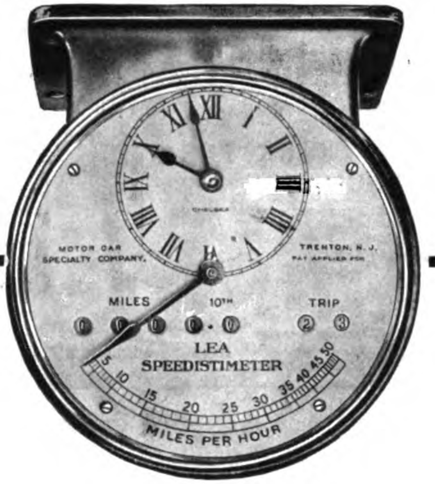
Boston Automobile Exchange, 173-177 Berkeley St., Boston, Mass. "Phelp."
Gas Engine Whistle Co., 1133 Broadway, N. City. (Pressure fuel feed device.)
Spacke, F. W. Machine Co., The, Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.

Pumps (Oil).

Detroit Lubricator Co., Hodges Bldg., Detroit, Mich.
Essex, G. B. Brass Co., 480 Franklin St., Detroit, Mich.
Grout Bros. Automobile Co., Orange, Mass.
Hewitt Motor Co., 6-10 E. 31st St., N. Y. City.
Madison-Kipp Lubricator Co., Madison, Wis.
Sherman, H. B. Mfg. Co., Battle Creek, Mich.
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
Star Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass. (Hand.)

Pumps (Automobile Tire).

Bride, Wm. J. & Co., Reading, Mass.
Bridgeport Brass Co., 253 Broadway, N. Y. City.
Carpenter, Geo. B. & Co., 202-08 S. Water St., Chicago, Ill.
Cleveland Faucet Co., Cleveland, Ohio.
Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Imperial Brass Mfg. Co., The, 245-247 S. Jefferson St., Chicago, Ill.
Judd & Leland Mfg. Co., Clifton Springs, N. Y.
Leather and Brass Mfg. Co., 22-24 Water St., Auburn, N. Y.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Motor Car Supply Co., The, 1427 Michigan Ave., Chicago, Ill. "Windejammer."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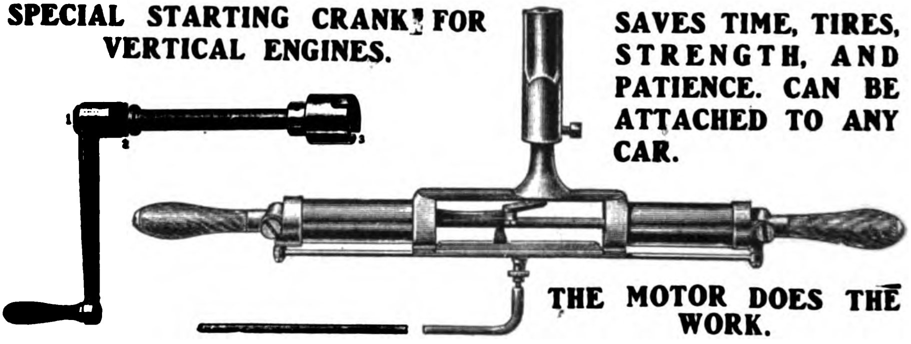
SAVES TIME, TIRES, STRENGTH, AND PATIENCE. CAN BE ATTACHED TO ANY CAR.



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"I have found your pump a great success. I could not be without it. In case of a puncture all that is necessary to inflate my tires, start the motor and the pump does the rest.

C. W. MIDDLETON, Philadelphia, Pa.

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THE AUTO PUMP CO.,

SPRINGVILLE, ERIE CO. NEW YORK, U. S. A.

BUYER'S GUIDE—Continued

Post & Lester Co., 20 Sargent St., Hartford Conn.
R. & C. Indicator Co., Bridgeport, Conn.
Ross & Kramer, 5607 S. Halsted St., Chicago, Ill.
Skinner & Skinner, 4133 Indiana Ave., Chicago, Ill.
Spacke, F. W. Machine Co., Indianapolis, Ind.
Ultra Pump and Power Co., Auburn, N. Y.
Wixon, H. H. & Co., 3514 S. California Ave., Chicago, Ill.
Wray Pump & Register Co., 191 Mill St., Rochester, N. Y.

Pumps (Water, for Steam Autos).

Clark, Edward S., 272-278 Freeport St., Boston, Mass.
Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Grout Bros. Automobile Co., Orange, Mass.
Locke Regulator Co., Salem, Mass.

Pump Connections (Auto).

International Auto. and Vehicle Tire Co., Milltown, N. J.
Newport Engineering Wks., 359-367 Thames St., Newport, R. I.
Stevens & Co., 99 Chambers St., N. Y. City.

Pump Connections (Cycle).

Goodrich, B. F., Co., Akron, Ohio.
International Auto. and Vehicle Tire Co., Milltown, N. J.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. (Swivel universal and right angle. "Neverleak.")
Nelson, A. Mfg. Co., 67-69 S. Canal St., Chicago, Ill. (Nipples.)
Park City Brass Co., Springfield, Mass. ("Star.")
Stevens & Co., 99 Chambers St., N. Y. City. ("Right Angle," "Keno," "Star," "Bulldog," "Wonder," etc.)
Youse, E. S., 46 N. 5th St., Reading, Pa. ("Perfect.")

Pump Parts (Cycle Tire).

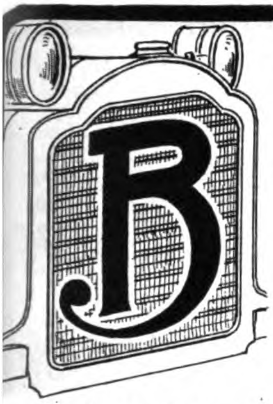
Leather and Brass Mfg. Co., 22 and 24 Water St., Auburn, N. Y. (Washers.)
Wolverine Leather Goods Co., Detroit, Mich. (Valve and plunger leathers.)

Pumps (Power and Storage).

Carr Machine Works, Leavenworth, Kas.
Cleveland Faucet Co., Cleveland, Ohio.
Crowell, Gilmer, 294-296 Graham St., Brooklyn, N. Y. (Air compressors.)
Fulmer, C. F., 415 Sycamore St., Plainfield, N. J. (Air compressors.)
Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Hastings & Anderson, 116 Lake St., Chicago, Ill. (Air compressor.)
Herz & Co., 187 Elm St., N. Y. City.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Cyclone."
Leather and Brass Mfg. Co., 22-24 Water St., Auburn, N. Y.
Mietz, Aug., 128-138 Mott St., N. Y. City.
New Era Gas Engine Co., 7 Dale Ave., Dayton, Ohio (Air compressors.)
Pacific Tucking and Mfg. Co., 471 18th St., Brooklyn, N. Y. "P. T. C."
Spacke, The F. W. Mach. Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind. (Air compressors.)
Stevens & Co., 99 Chambers St., N. Y. City.
Westinghouse Air Brake Co., Pittsburg, Pa. (Steam and motor driven compressors.)

Radiators.

A-Z Co., The, 462 Eleventh Ave., N. Y. City.
Bliss-Chester Co., 31 Mathewson St., Providence, R. I.
Borbein, H. F & Co., 2109 N. 9th St., St. Louis, Mo.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y.
Briscoe Mfg. Co., 1627 Woodward Ave., Detroit, Mich.
Burn, W. S. Mfg. Co., The, New Haven, Conn.
Detroit Auto. Specialty Co., 12-14 Sherman St., Detroit, Mich.



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ALWAYS IN FRONT.

We are in the midst of our most prosperous season and are proud of the popularity of our product as evidenced by its general adoption.

Briscoe construction has won out through its merits both of design and construction. Both of our plants are busy with orders from the most representative car builders. We have shown our ability to provide the best results for those wishing either tubular or honeycomb radiators. We have also enlarged our line of products to embrace all the sheet metal parts required on both water and air cooled automobiles.

Our exhibits at all the shows will be well worth visiting by automobile manufacturers and assemblers. We will have on exhibition the latest designs in which we have made up our several styles of trustworthy radiators as well of samples of new methods of water circulation developed by us in our experimental department. We may be found at the Garden in Section 72, Elevated Platform, at the Armory in Section 15 Gallery, at the Coliseum in Section 134, and at the Detroit Armory in Section 27 Gallery.

Our two plants bring **BRISCOE PARTS** within reach of all automobile builders and our workmanship remains **the very best.**

We are makers of

- Both Honeycomb and Tubular **RADIATORS.**
- Iron and Aluminum **HOODS AND FENDERS.**
- Sheet metal **DECK BOXES, SEATS AND MUFFLERS.**
- Ornamental **HOOD FRONTS** for air cooled cars.
- Galvanized iron and copper Gasoline and Water **TANKS.**
- Concave Sheet Metal **DASHES.**

Write to our nearest office for estimates.

BRISCOE MFG CO.

Eastern Branch Factory
NEWARK, N. J.

Main Office and Factory
DETROIT, MICH.

BUYERS' GUIDE—Continued

Radiators (Continued).

Fedders Mfg. Wks., 1592 Genesee St., Buffalo, N. Y.
Hayes Mfg. Co., The, 825-45 Maybury Grand Ave., Detroit, Mich.
Hussey Drop Forge Mfg. Co., Axtell St., Cleveland, O.
Janney, Steinmetz & Co., 4th and Market St., Phila., Pa.
Kells, W. N., Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio.
Long Mfg. Co., 381-385 Wabash Ave., Chicago, Ill.
Long-Turney Mfg. Co., The, Rome, N. Y.
Mayo Radiator Co., The, State and Mill River Sts., New Haven, Conn.
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.
Reading Metal Body Co., Fleetwood, Pa.
Rogers, Geo. D., Automobile Parts Mfg. Co., The, 56 Kinsman St., Cleveland, Ohio. (To design.)
Stolp Mfg. Co., N. W. cor. Huron and Townsend Sts., Chicago, Ill.
Trageser, John, Steam Copper Wks., 447 W. 26th St., N. Y. City.
Whitlock Coil Pine Co., Hartford, Conn.

Radiator Parts.

Bliss-Chester Co., 31 Mathewson St., Providence, R. I.
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Miss. (Disks.)
Diamond Stamped Ware Co., Summit Ave., Detroit, Mich.
Stolp Mfg. Co., N. W. cor. Huron and Townsend Sts., Chicago, Ill. (Tubing.)
Worcester Pressed Steel Co., Worcester, Miss. (Fins.)

Rain Aprons.

Auto. Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City.
Auto. Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Balto. Buggy Top Co., The, 700-702 Penna. Ave., Baltimore Md.
Boyle, John W. & Co., 112-114 Duane St., N. Y. City.
Collins Buggy Co., Akron, Ohio.
Detroit Motor Car Supply Co., 1256 Jefferson Ave., Detroit, Mich.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Gilbert Mfg. Co., New Haven, Conn.
Indianapolis Dash Co., Indianapolis, Ind.
Kroh, C. Z., Mfg. Co., 120 St. Clair St., Toledo, Ohio.
National India Rubber Co., Bristol, R. I.
Nathan Novelty Mfg. Co., 86-90 Reade St., N. Y. City. (Rain and dust aprons.)
Newton, W. H. & Son, Cortland, N. Y.
Perfection, The Storm Shield Co., S. Main St., Clyde, O.
Springfield Auto. Top and Upholstering Co., 102-106 Dwight St., Springfield, Mass.
Vehicle Apron & Hood Co., 196 E. Rich St., Columbus, O.

Raw Material.

Blake, Edwin J., Hartford, Conn. (Special alloy.)
Boker, Herman & Co., 101 Duane St., New York City. (Nickel steel for axles, transmission shafts and gears.)
Breese & Lawrance, 5 W. 16th St., New York City. (Aluminum alloy for castings.)
Damascus Bronze Co., Pittsburg, Pa. (Phosphorized copper, phosphor bronze.)
Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre for bushings.)
Hurd & Haggin, 316 Hudson St., N. Y. City. (Nickel steel for gears.)
Kells, Thos., Sons Co., The, 240 India St., Brooklyn, N. Y. (For boats.)
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa. (Gear metals.)
Phosphor Bronze Smelting Co., The, 2200 Washington Ave., Philadelphia, P. (Phosphor bronze.)
Pittsburg Reduction Co., The, Pittsburg, Pa. (Aluminum ingots, sheets, bars, rods and wire.)
Prosser, Thos. & Son, 15 Gold St., New York City. (Krupp steel.)
Reeves, Paul S. & Son, 1415 Catherine St., Phila., Pa. (Phosphor bronze wire, rods, sheets, and white brass in castings and ingots.)
Taunton-New Bedford Copper Co., Taunton, Mass. (Brass and copper.)
Victor Metals Co., The, East Braintree, Mass. "Victor." (Non-corrosive silver metal.)

Repairs, Sales and Storage.

Eclipse Automobile Co., Columbus, Ohio.

Reversing Gears and Clutches (Boat)

Auto Engine Works, St. Paul, Minn.
Automatic Clutch Co., Hamilton Bldg., Akron, Ohio.
Ball Mfg. Co., 388 Pacific St., Stamford, Conn.
Benton, Thos. P. & Son, La Crosse, Wis.
Brodie, W. H. Co., 45 Vesey St., N. Y. City.
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Continental Motor Mfg. Co., 242-44 W. Lake St., Chicago, Ill.
Crouch, Chas. P. & Co., 472-484 Carroll Ave., Chicago, Ill.
Gearless Transmission Co., Glens Falls, N. Y. ("Gearless.")
Gies, Frank G. & Co., 165-167 Field Ave., Detroit, Mich. "Gies."
Griswold Mfg. Co., The, Quincy, Mass.
Holliday Mfg. and Engineering Co., 160 Bunker St., Chicago, Ill.
Hub Motor Co., The, 34 Beach St., Boston, Mass.
Jager, Chas. J. Co., 166-168 High St., Boston, Mass.
Johnson, Carlyle, Machine Co., Hartford, Conn.
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.
Phila. Boat and Engine Co., 1017 N. Front St., Phila., Pa.
Phillips Motor Works, 133 La Salle St., Chicago, Ill.
Trebert Auto. and Marine Motor Co., 407 St. Paul St., Rochester, N. Y.
Tuttle, H. A. Mfg. Co., South Norwalk, Conn.
Warner Gear Co., Muncie, Ind.

Rims (Automobile).

American Wood Rim Co., Onaway, Mich. (Wood.)
Auto Supply Co., Inc., 1662 Broadway, N. Y. City. (Wood.)
Bryant Steel Wheel and Rim Co., The, 429 Hayden Bank Bldg., Columbus, Ohio. (Steel.)
Firestone Tire and Rubber Co., Akron, Ohio. (Steel.)
G. & J. Tire Co., Indianapolis, Ind. (Steel.)
Hagerstown Spoke and Bending Co., Hagerstown, Md. (Wood.)
Jamesville Mfg. Co., Jamesville, N. Y. (Steel.)
K. & C. Mfg. Co., Henniker, N. H. (Wood) "Lock Joint."
Midgley Mfg. Co., Dublin Ave., Columbus, Ohio. (Steel.)
Republic Rubber Co., Youngstown, Ohio. (Interlocking.)
Smith, A. O. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis. (Steel.)
Standard Welding Co., 35 Cone St., Cleveland, O. (Steel.)
Weston-Mott Co., Utica, N. Y. (Steel.)

Rims (Cycle).

American Wood Rim Co., Onaway, Mich. (Also motor cycle.)
G. & J. Tire Co., Indianapolis, Ind. (Cycle and motor cycle.) "G. & J."
K. & C. Mfg. Co., Henniker, N. H. (Lock joint.)
Standard Welding Co., 35 Cone St., Cleveland, Ohio.

Robes.

Bishop, The J. H. & Co., Wyandotte, Mich.
Chase, L. C. & Co., 129 Washington St., Boston, Mass.
Chicago Auto. Robe Supply Co., 155-9 Market St., Chicago, Ill.
Davis Robe Co., The, Inc., 126 State St., Chicago, Ill. "Davis."
Draper Bros. Co., Canton, Mass. "Draper."
Dusenbury, Louis, 86-88 Worth St., N. Y. City.
Riley, Wm. B. & Co., 324 Market St., Phila., Pa.
Scandinavian Fur and Leather Co., 14-16 W. 33rd St., N. Y. City.
Stern Bros., West 23rd St., N. Y. City.
Western Robe Co., Detroit, Mich.

Roller Bearings (Automobile).

American Roller Bearing Co., S. Framingham, Mass.
Bantam Anti-Friction Co., Bantam, Conn.
Hyatt Roller Bearing Co., Harrison, N. J.
McKeel, Geo. A. Co., Ltd., Jackson, Mich.
Moffett Vehicle Bearing Co., 922 S. Niagara St., Saginaw, W. S., Mich. "Moffett."
Steel Ball Co., The, 832 Austin Ave., Chicago, Ill.
Timken Roller Bearing Axle Co., Canton, Ohio.

Rubber Tubing.

Hartford Rubber Works Co., Hartford, Conn.
International Auto. and Vehicle Co., Milltown, N. J.

Rubber Fittings (Automobile).

International Auto. and Vehicle Tire Co., Milltown, N. J.

Rubber Fittings (Cycle).

Goodrich, B. F. Co., Akron, Ohio.
Goodyear Tire and Rubber Co., Akron, Ohio.
Hartford Rubber Works Co., Hartford, Conn.
India Rubber Co., 16 Warren St., N. Y. City.
International Auto. and Vehicle Tire Co., Milltown, N. J.

Running Gears.

Auto. Supply Co., Inc., 1662 Broadway, N. Y. City.
Borbein, H. F. & Co., 2109 N. 9th St., St. Louis, Mo. (Angle iron and pressed steel.)
Boss Knitting Mach. Wks., cor. Elm and Reed Sts., Reading, Pa.
Bradford Motor Co., Bradford, Pa.
Elwell-Parker Elec. Co. of America, Hamilton, Case Av. and Belden Sts., Cleveland, Ohio.
Fast Mach. and Tool Wks., 1061-1063 29th Ave., Milwaukee, Wis.

Hoods, Fenders, Tanks. To your blue prints.

"Kinwood" Radiators. Greatest efficiency per lb. weight. Least damage if frozen.

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"Kinwood" Pressed Steel Frames. Members or Assembled complete.

"Kinwood" Mufflers. Compact. Without back pressure.

See our exhibit at New York Show, Armory, Room E balcony and Chicago Show, Armory, space A-71.

Kinsey Mfg. Co.

Dayton, Ohio, U. S. A.

BUYER'S GUIDE—Continued.

RUNNING GEAR—Continued.

Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Muncie Auto. Parts Co., Muncie, Ind.
Muncie Wheel and Jobbing Co., Muncie, Ind. (Angle iron.)
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Smith, A. O. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Standard Roller Bearing Co., 49th and Girard Ave., Philadelphia, Pa.
Torbensen Motor Car Co., Bloomfield, N. J.
U. S. Motor Carriage Co., Rumford Falls, Me.
Walker, E. C. Co., 1913-23 Logan St., Louisville, Ky.

Running Gear Parts.

Borbein, H. F. & Co., 2109 N. 9th St., St. Louis, Mo. (Spring block bearings.)
Clark, Edward S., 272 Freeport St., Boston, Mass.
Neustadt Auto. and Supply Co., 826 S. 18th St., St. Louis, Mo.

Rust Preventatives.

Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill "Helmet."
Chandler & Farquhar Co., 34 Federal St., Boston, Mass. "Cristoline."
Cole, G. W. Co., 143 Broadway, N. Y. City. "3 in 1."

Saddles.

Mesinger, H. & F. Mfg. Co., 1801-03 1st Ave., N. Y. City. (Also motor cycle.)
Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass. (Also motor cycles.)
Troxel Mfg. Co., Elyria, Ohio. ("Troxel.")
Wolverine Leather Goods Co., Detroit, Mich. ("Wheeler.")

Saddle Clamps.

Corbin Screw Corporation, New Britain, Conn.
Persons Mfg. Co., 54-68 Bloomingdale Rd., Worcester, Mass.

Screw Drivers.

Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. (Magazine.)
Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.
Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y.
Patterson, Gottfried & Hunter, 146-150 Centre St., N. Y. City.
Vanderbeek Tool Co., The, Hartford, Conn.

Schools.

Manhattan Automobile School, 315-21 W. 96th St., N. Y. City.
New York School of Automobile Engineers, 146 W. 56th St., N. Y. City.

Screw Machine Parts.

Auto. Supply Co., Inc., 1662 Broadway, N. Y. City.
McCord & Co., 84 Van Buren St., Chicago, Ill.

Seats (Automobile).

American Veneer Co., 100 Market St., Kenilworth, N. J.
Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Metal.)
Collins Buggy Co., Akron, Ohio. (Dos-a-Dos.)
Coops, C. W. & Co., 3 Appleton St., Boston, Mass. (Seat bendings.)
Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn.
Dayton Folding Tonneau Co., 1141 N. Main St., Dayton, Ohio. (Folding rear.)
Detroit Carriage Co., Detroit, Mich.
Halliday, O. A., 42 Cedar St., Oneida, N. Y.
Hayes Mfg. Co., The, 825-45 Maybury Grand Ave., Detroit, Mich.
Heyer, A. P., Bloomfield, N. J.
Heywood Bros. & Wakefield Co., 174 Portland St., Boston, Mass.
Indianapolis Dash Co., Indianapolis, Ind. (Dos-a-Dos.)
New I. D. Seat Co., Rohrerstown, Pa. (Auxiliary.)
Newton, W. H. & Son, Cortland, N. Y.
Schubert Bros. Gear Co., Oneida, N. Y.

Seats (Boat).

Bailie Basket Co., 85-87 Hudson St., Boston, Mass. (Cane.)

Seat Posts.

Reading Standard Cycle Mfg. Co., Reading, Pa.
Reeves Ideal Mfg. Co., Saginaw, W. S., Mich.
Smith, Jos. N. & Co., Fourth and Porter Sts., Detroit, Mich. (Smith "Two Roller Spring.")
Standard Welding Co., Cleveland, Ohio. (Seamless.)

Second Hand Automobiles.

Graham Cycle Co., 601-605 Madison St., Chicago, Ill.
Broadway Auto. Exchange, Inc., 513-15 7th Ave., N.Y. City.
Inter-State Auto. Touring Co., 5 E. 42nd St., N. Y. City.
Manhattan Storage Co., 42-44 Cortlandt St., N. Y. City.
Manufacturers' Motor Car Co., 54-56 W. 43rd St., N. Y. City.
Times Square Auto Co., 164 W. 46th St., N. Y. City.

Sheet Metal Articles.

A-Z Co., The, 462 Eleventh Ave., N. Y. City. (Sprocket steps and mud aprons.)
Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Fans and mud aprons.)
Childs, S. D. & Co., 200 Clark St., Chicago, Ill. (Brass, steel or aluminum articles.)
Crosby Co., The, 177-187 Pratt St., Buffalo, N. Y.
Detroit Auto. Specialty Co., 12-14 Sherman St., Detroit, Mich.
Ellis, F. L. & Son, Milldale, Conn.
Fedders Mfg. Works, 1592-98 Genesee St., Buffalo, N. Y.
Long-Turney Mfg. Co., Rome, N. Y.
Mayo Radiator Co., The, State and Mill River Sts., New Haven, Conn.
Middletown Auto. Body Co., Durham Road, Middletown, Conn.
Riley-Klotz Mfg. Co., 19 Mulberry St., Newark, N. J.
Sands, A. B. & Sons Co., 262 Water St., N. Y. City.
Worcester Pressed Steel Co., Worcester, Mass.

Shock Absorbers and Auxiliary Springs.

American Shock Absorber Co., Easton, Pa.
Baldwin Chain and Mfg. Co., Dept. B, 31 Herman St., Worcester, Mass. "House."
Chaney, The A., Mfg. Co., Terre Haute, Ind. "Chaney."
Diezemann Shock Absorber Co., 1311 Hudson St., Hoboken, N. J.
Gabriel Horn Mfg. Co., 970-972 Hamilton St., Cleveland, O. "Foster."
Godshalk, E. H. & Co., 23rd and Hamilton Sts., Philadelphia, Pa.
Graham Co., The, 84 Waumbeck St., Boston, Mass.
Hartford Suspension Co., 67 Vestry St., N. Y. City.
Indianapolis Bolster Spring Co., Indianapolis, Ind. "Victor."
Kelsey Suspension Co., Tarrytown, N. Y.
Kilgore Auto. Air Cushion Co., 46 Columbus Ave., Boston, Mass. "Kilgore."
Meckel, Fred. L., 77-83 E. 13th St., Chicago, Ill.
Sheddan Mfg. Co., The, 136 W. Fayette St., Balto., Md.
Supplementary Spiral Spring Co., The, 4524-4526 Delmar Ave., St. Louis, Mo.
Walker, E. C. Co., 1913-23 Logan St., Louisville, Ky.

Slat Irons.

Automobile Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City.
Brown, S. N. & Co., Dayton, Ohio.
Coops, C. W., 3 Appleton St., Boston, Mass.

Spanners.

Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
Forsyth Mfg. Co., 306-314 Terrace, Buffalo, N. Y. ("Forsyth" cone.)

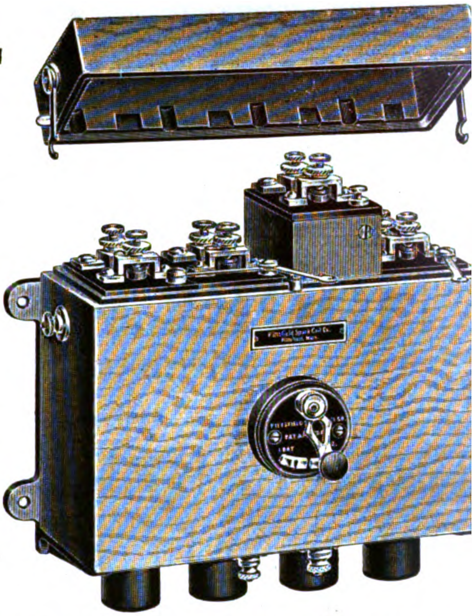
Spark Coils.

American Coil Co., Foxboro, Mass.
Autocoil Co., The, 136 7th St., Jersey City, N. J. "Jumphlame."
Brennan Motor Co., 101 Grape St., Syracuse, N. Y.
Byrne, Kingston & Co., Kokomo, Ind.
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago, Ill.
Champion, Albert Co., 541 Tremont St., Boston, Mass. "Nieuport."
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw and Machine Co., The, 344 Kaiser St., Columbus, Ohio.
Connecticut Telephone and Electric Co., Meriden, Conn. (National Sales Corporation, 286 Broadway, N. Y. City, Factory Sales Mgr.)
Curtis, F. G., 186 Milwaukee St., Milwaukee, Wis.
Dayton Electrical Mfg. Co., The, 808-12 Reibold Bldg., Dayton, Ohio. "Apple."
Dow Portable Electrical Co., Braintree, Mass.
Duplex Coil Co., The, Fond du Lac, Wis. "Mueller."
Elbridge Electrical Mfg. Co., Elbridge, N. Y.
Electric Contract Co., 202-4 Centre St., N. Y. City.
Excelsior Spark Plug Co., Cleveland, Ohio.
Fischer Special Mfg. Co., 2076 Reading Road, Cincinnati, Ohio.

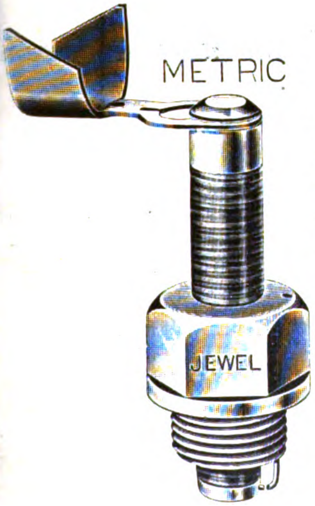
Pittsfield

Ignition Specialties

For 1906

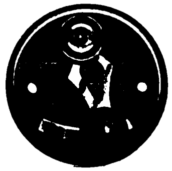


PITTSFIELD SPARK COILS are as near perfection as human skill and ingenuity can make them. The insulation is of the best, and they cannot be punctured or ruptured. An extremely fast vibrator is a feature, and all adjustments are by lock nuts, which cannot become loosened. Made for one, two, three, four and six cylinder dash type; and one, two three and four cylinder box type. Smallest and most efficient American Coil made.



THE 1906 JEWEL SPARK PLUG, while o the same excellence of manufacture that has given it wide popularity, is different from previous models, in that it is much shorter, the core being ground on a taper into the shell which makes it easy to remove and clean, and it is also made with a novel connection which does away with the binding nut, and also obviates the trouble of twisting the core by a person using a wrench or pliers for fastening the nut. The advantages of a plug of this kind can readily be seen. We are daily receiving large orders for them.

THE 1906 PITTSFIELD TIMER AND SWITCH are now ready. They are fully up to the Pittsfield Standard - the best that can be produced.



For further information address,

Pittsfield Spark Coil Co.,

Pittsfield, Mass.

MOORE AUTOMOBILE CO.

571 Fifth Ave., New York.

MOORE 40 H. P. CAR

"THE BALL BEARING CAR."

EVERY REVOLVING SHAFT ON BALL BEARINGS. SIMPLICITY IN CONSTRUCTION AND OPERATION.

BUYER'S GUIDE—Continued.

SPARK COILS—Continued.

Frost Mfg. Co., Columbus, Ohio.
Geer, Harry R. Co., 1017 Pine St., St. Louis, Mo. (Motor cycle.)
Goodson Electric Ignition Co., 94 Point St., Providence, R. I. (Also primary "Goodson.")
Hardy, R. E. Co., 225 W. Broadway, N. Y. City.
Harrison, H. K., 378-380 E. 7th St., St. Paul, Minn.
Heinze Electric Co., Lowell, Mass.
Hercules Electric & Mfg. Co., 707-709 Langsdale Ave., Indianapolis, Ind.
Induction Coil Co., The, 9-10-11 Miller Bldg., Milwaukee, Wis.
International Brass & Electric Co., 76 Beekman St., N. Y. City.
Knoblock-Heideman Co., The, South Bend, Ind. (Also primary coils.)
Kokomo Electric Co., The, Kokomo, Ind.
McKibbon Mfg. Co., S. Norwalk, Conn.
Merkel Motor Co., Layton Park, Milwaukee, Wis. (Motor cycle.)
Mosler, A. R. & Co., 1679 Broadway, N. Y. City.
National Carbon Co., W. Madison and Highland Ave., Cleveland, Ohio. "National."
National Coil Co., 115-117 Michigan Ave., Lansing, Mich.
Never-Miss Spark Plug Co., Lansing, Mich.
New England Coil Winding Co., Atlantic, Mass.
New York Coil Co., 338 Pearl St., N. Y. City.
Noxon, G. P., 500 E. Water St., Syracuse, N. Y.
Nungesser Electric Battery Co., 27-33 King St., Cleveland, Ohio. (Primary.)
Ohio Electric Works, 76-78 Ellen St., Cleveland, Ohio.
Pittsfield Spark Coil Co., Pittsfield, Mass.
Raspberry Island Boat and Engine Co., St. Paul, Minn.
Roche, Wm., Dry Battery Co., 52-54 Park Place, N. Y. City.
Rogers, Geo. D., Automobile Parts Mfg. Co., 56 Kinsman St., Cleveland, Ohio.
Rubay, Leon, 140 West 38th St., N. Y. City.
Schug Electric Mfg. Co., Champlain and Beaubien Sts., Detroit, Mich.
Seidler-Miner Electric Co., 207-211 Jefferson Ave., Detroit, Mich.
Splitdorf, C. F., 23 Vandewater St., N. Y. City.
Tritt Electric Co., The, Union City, Ind.
Williams, E. Q., 535 S. Clinton St., Syracuse, N. Y.

Spark Intensifiers.

Herz & Co., 189 Elm St., N. Y. City.
Induction Coil Co., The, 9-10-11 Miller Bldg., Milwaukee, Wis.
Littlefield, H. A. & Co., 16 Avon St., West Lynn, Mass.
Mosler, A. R. & Co., 1679 Broadway, N. Y. City.
Motor Car Supply Co., The, 1427 Michigan Ave., Chicago, Ill. "Gem."
Pittsfield Spark Coil Co., Pittsfield, Mass.
Rajah Auto-Supply Co., 140 Washington St., New York.

Speed Change Gears.

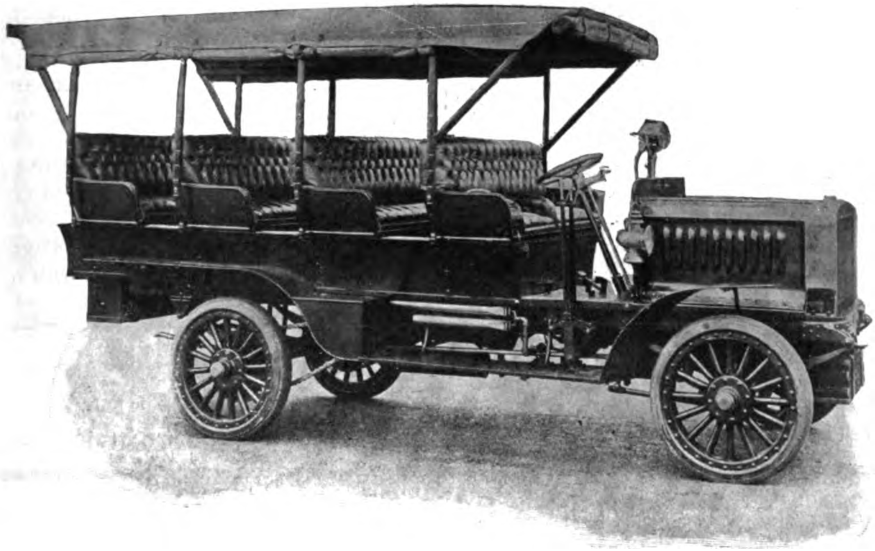
(See "Transmission Devices.")

Spark Plugs.

Albright Mfg. Co., Columbus, Ga. "Albright."
American Coil Co., Foxboro, Mass. "Sherman" and "American."
Anderson, J. C., Mfg. Co., Inc., 153 Newell Ave., Rutherford, N. J.
Anderson Spark Plug Co., 100 Boylston Street, Boston, Mass.
Auto. and Power Appliance Co., 357-359 The Arcade, Cleveland, Ohio.
B. & J. Mfg. Co., 1218-20 Michigan Ave., Chicago, Ill.
Benford, E. M., 64-66 Murray St., N. Y. City.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y.
Bullock Igniter Co., The, Cleveland, Ohio.
Byrne, Kingston & Co., Kokomo, Ind.
Canedy, Earl, Chicago Heights, Ill.
Cavanaugh & Darley, 21-25 Plymouth Court, Chicago, Ill.
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw and Machine Co., The, 244 Kaiser St., Columbus, Ohio.
Constant Co., The, 188 Columbus Ave., Boston, Mass.
Gerson-Carey Co., Lansing, Mich.
De Luxe Mfg. Co., 1513 Seneca St., Buffalo, N. Y.
Dow Portable Electric Co., Braintree, Mass.
Elbridge Electrical Mfg. Co., Elbridge, N. Y.
Duplex Ignition Co., 125 N. 32nd St., N. Y. City.
Excelsior Spark Plug Co., Cleveland, Ohio.
Excelsior Supply Co., 233-235 Randolph St., Chicago, Ill.
Fischer Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.
Fourforone Spark Plug Co., 23 E. Lake St., Chicago, Ill.
Fulmer, C. F., 415 Sycamore St., Plainfield, N. J.
Funke, A. H., 83 Chambers St., N. Y. City. "Baldwin."
Geer, Harry R. Co., 1017 Pine St., St. Louis, Mo.

Iroquois Truck

Built Like a Locomotive



Standard Iroquois, 60 H. P. Chassis, Equipped with 15 Passenger Body

Our years of experience in heavy work especially adapts us for manufacturing trucks that cannot be surpassed for reliability and durability. Everyone interested in heavy traffic vehicles should visit our exhibit at the Armory Show in New York or Chicago. We manufacture also automobiles for railroad use, built along the lines of locomotives for construction and strength with capacity for from 30 to 50 passengers.

Our 4 cylinder 20 H. P. Runabout, equipped with solid tires is a revelation to the business man who has use for a car of this kind. It never lays down and will last for years. Visit us at the shows or write us for information.

IROQUOIS IRON WORKS

BUFFALO, N. Y.

Sales Department—G. MIDDLETON, 1900 Land Title Bldg., Philadelphia, Pa.

THE McGIEHAN

Combined Speedometer

The most up-to-date and correct instrument on the market.

Absolutely guaranteed to give satisfaction.

Speed indicated from two to sixty miles.

Also mileage traveled each trip and total season's mileage.

Operates with metal-covered flexible shaft from dash to front wheel.

13775
203157
MILES PER HOUR
0
5
10
15
20
25
30
35
40
45
50
55
60
SPEED AND MILE
INDICATOR
McGIEHAN
NEW YORK

The McGiehan Speedometer is not a toy. No watch works, hair springs, etc., to get out of order.

But an instrument built to stand the speed and heavy strain of the automobile. We guarantee that you know your speed and mileage traveled at all times.

Model A accurately records the trip (reset at will) and total mileage traveled.

ODOMETERS

Model B records total mileage.

Write for Catalogue C

DIAL, 8¼ x 8¾

Telephone 3018 Madison

McGIEHAN MFG. CO., 137 West 32nd Street, N. Y.

BUYERS' GUIDE—Continued

Spark Plugs (Continued).

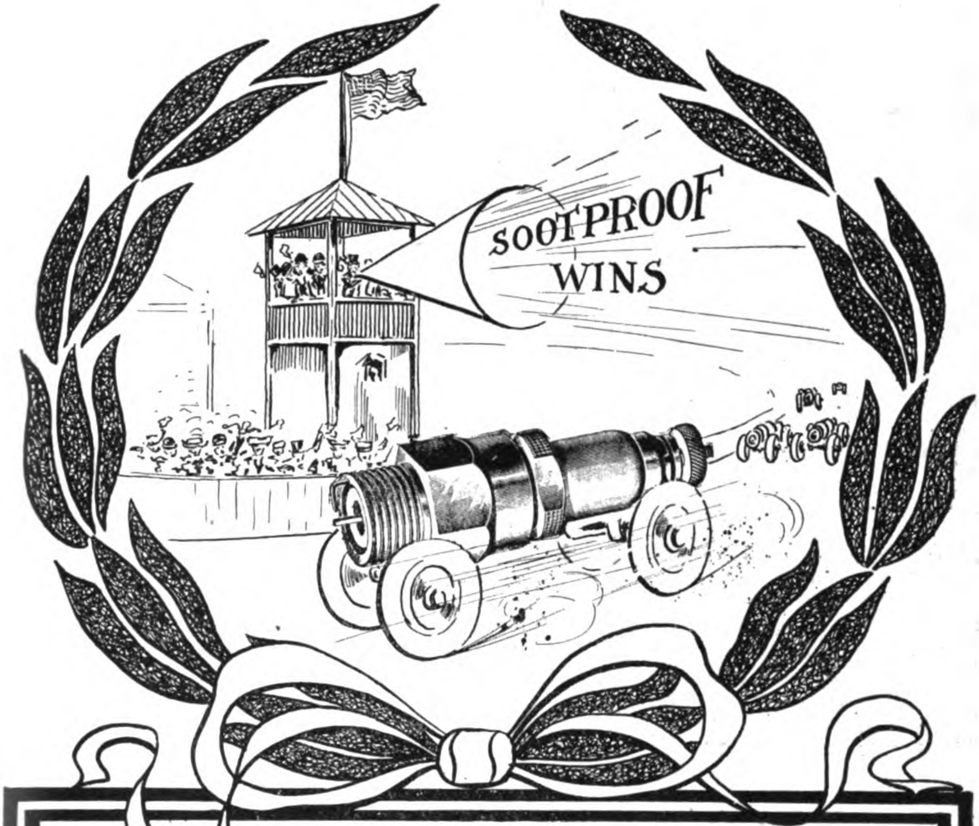
Gilbough, B. G., Room 312, 36 La Salle St., Chicago, Ill.
Hardy, R. E., 225 W. Broadway, N. Y. City.
Hastings & Anderson, 116 Lake St., Chicago, Ill.
Hatcher Auto-Parts Co., The, 138 Viaduct, Cleveland, O.
Herz & Co., 189 Elm St., N. Y. City. Bougie "Herz."
Induction Coil Co., The, 9-10-11 Miller Bldg., Milwaukee, Wis.
Knoblock-Heideman Co., The, South Bend, Ind.
Kokomo Electric Co., The, Kokomo, Ind.
Lipman, Carl E. L., Beloit, Wis. "Billy Hell."
Little & Eastman Co., 595 Harrison Ave., Boston, Mass.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Mayo Damper Co., 355 Walnut St., Pottstown, Pa.
Mechanical Plug Co., 3924 Olive St., St. Louis, Mo.
Merkel Motor Co., Layton Park, Milwaukee, Wis. (Motor cycle.)
Mezgar, C. A., 203 W. 80th St., Brooklyn, N. Y. (National Sales Corporation, 256 Broadway, N. Y., Factory Sales Mgr.)
Miller, Chas. E., 97-101 Reade St., New York, N. Y.
Miller Mfg. Co., 813 Central Ave., Peekskill, N. Y.
Mosler, A. R. & Co., 1679 Broadway, N. Y. City. "Spit Fire."
Never-Miss Spark Plug Co., Lansing, Mich. "Never Miss."
Oakes & Dow Co., The, 40 Sudbury St., Boston, Mass. "Comet" and Sootless.
Orswell Ignition Co., 102 Pearl St., Boston, Mass.
Parker Lock-Switch Co., The, Montclair, N. J.
Phoenix Automobile Supply Co., 3939 Olive St., St. Louis.
Pittsfield Spark Coil Co., Pittsfield, Mass. "Jewel."
Pope Mfg. Co., Hartford, Conn.
Post & Lester Co., The, 20 Sargeant St., Hartford, Conn.
Rajah Auto-Supply Co., 140 Washington St., New York.
Richards, F. H., 15 Murray St., N. Y. City.
Richardson Engineering Co., 36 Pearl St., Hartford Conn.
Roche, Wm., Dry Battery Co., 52-54 Park Place, N. Y. City.
Rogers, Geo. D., Automobile Parts Mfg. Co., 56 Kinsman St., Cleveland, Ohio.
Rubay, Leon, 140 West 38th St., N. Y. City.
Seidler-Miner Electric Co., 207-211 Jefferson Ave., Detroit, Mich. "S.-M."
Shain, Chas. D., 70 Murray St., N. Y. City.
Smith, Geo. D., Jr., Baldwins, L. I., N. Y.
Splitdorf, C. F., 23 Vandewater St., N. Y. City.
Thurston Mfg. Co., The, 356 E. 57th St., Chicago, Ill.
Tritt Electric Co., The, Union City, Ind.
Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.
Utility Co., The, 235 Greenwich St., N. Y. City.
Willis, E. J. Co., 10 Park Place, New York, N. Y. 'Yankee" and "H. M."

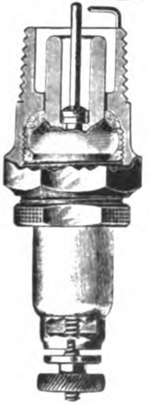
Spars.

Fraser Hollow Spar and Boat Co., Greenpoint, L. I., N. Y.
Pigeon Hollow Spar Co., 116 Condor St., East Boston, Mass.

Speed Indicators.

Bullard, J. H., Springfield, Mass. (Speedometer, Odometer, Clock, combined.)
Chicago Pneumatic Tool Co., Fisher Bldg., Chicago, Ill. "Boyer."
Chrono-Velocimeter Co., The, 1213 Filbert St., Phila., Pa.
Electric Speed Meter Co., The, 141 E. 4th St., Cincinnati, Ohio.
Jones, Jos. W., 127 W. 32nd St., N. Y. City. "Jones." (Auto., Boat and Cycle.)
Lipman, Carl E. L., Beloit, Wis.
Loring, E. J., Somerville, Mass.—(Also speedometers and odometers combined.)
McGiehan Mfg. Co., 137 W. 32nd St., N. Y. City.
Monitor Speed Recorder Co., 247 Pearl St., Cambridge, Mass.
Motor Car Specialty Co., 143 E. State St., Trenton, N. J. (Combination speed meter, odometer and clock.)
Rollins Mfg. Co., Park Square Motor Mart, Boston, Mass. (Combined speedometers and odometers.)
Smith, R. H. Mfg. Co., Springfield, Mass. (Also speedometer and odometer, combined.)
Uncas Specialty Co., 21-37 Shipping St., Norwich, Conn.
Veeder Mfg. Co., Sargeant and Garden Sts., Hartford, Conn. "Veeder Tachometer."
Warner Instrument Co., 51 Roosevelt Ave., Beloit, Wis. "Warner."
Webb Co., The, 1679 Broadway, N. Y. City.
Wheelock Motor Car Clock Co., Tremont Bldg., Boston, Mass. (Speedometers and odometers combined—"Wheelock.")
Wood Speedometer Co., 106 Sudbury St., Boston, Mass.





Five Prizes Were Awarded

to the cars using

"SOOT-PROOF" PLUGS

THE "McMURTRY" PRIZE

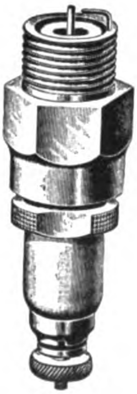
for the car having the
least ignition troubles

WAS AWARDED TO A. REO

using

"SOOT-PROOF" PLUGS

These cars covered a distance of 700 miles during the **National Economy Test** of the **New York Motor Club,** October 30th-Nov. 4th, 1905.



These cars had absolutely no Spark Plug troubles, and the original plugs were used throughout the entire run.

Thus again has the "Soot-Proot Plug demonstrated its superiority, reliability and economy.

"SOOT-PROOF" in Name and Fact. Non-short-circuiting. Self Cleaning

C. A. MEZGER, 203 W. 80th St., New York

BUYER'S GUIDE.—Continued.

Splash Aprons.

Automobile Equipment Co., 251 Jefferson Ave., Detroit, Mich.
Boyle, John & Co., 112-114 Duane St., New York City.
Gilbert Mfg. Co., New Haven, Conn.

Spokes (Cycle).

Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Jamesville Mfg. Co., Jamesville, N. Y.
Standard Co. The, Torrington, Conn. (And auto.)
Toledo Metal Wheel Co., Toledo, Ohio.

Spoke Nipples (Cycle).

Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Jamesville Mfg. Co., Jamesville, N. Y.
Standard Co., The, Torrington, Conn. (And auto.)
Toledo Metal Wheel Co., Toledo, Ohio.

Spoke and Nipple Grips (Cycle).

Cole, G. W. Co., 143 Broadway, N. Y. City. ("Victor," "Neveralit" and "Baby.")

Spoke Nipple Washers (Cycle).

Aurora Automatic Mach. Co., Aurora, Ill.

Springs (Body).

Annable-Fitzgerald Engineering and Mfg. Co., 509 Michigan Trust Co. Bldg., Grand Rapids, Mich. (Pneumatic body spring suspension.)
Armstrong, The J. B. Mfg. Co., Flint, Mich.
Auto. Improvement Co., The, 304 Hudson St., N. Y. City. "Ever-ready."
Cleveland-Canton Spring Co., Canton, Ohio.
Detroit Steel Products Co., 91-99 East Fort St., Detroit, Mich.
Dunbar Bros., Bristol, Conn.
Hess-Pontiac Spring and Axle Co., Pontiac, Mich.
Hill, Louis A., 1336 N. Y. Ave., Washington, D. C. (Licensor under spring suspension patent.)
Indianapolis Bolster Spring Co., Indianapolis, Ind.
Keystone Spring Works, 13th and Buttonwood St., Philadelphia, Pa.
Merrill, E. R. Spring Co., 526 W. 28th St., New York, N. Y.
Muncie Wheel and Jobbing Co., Muncie, Ind.
Penn, The, Spring Works, Inc., Baldwinsville, N. Y.
Phila. Ornamental Wire Co., 628-630 Filbert St., Phila., Pa.
Rowland, Wm. & Harvey, Tacony Road and P. R. R., Philadelphia, Pa.
Tuthill Spring Co., 211 West Polk St., Chicago, Ill.
Waugh Draft Gear Co., The, 1525 Monadnock Bldg., Chicago, Ill.

Springs (Cycle).

Errick, C. W., North Tonawanda, N. Y. (Saddle.)

Springs (Small).

Wallace-Barnes Co., The, Bristol, Conn. (For valves, igniting devices, brake bands, levers, controls, etc.)
Boston Woven Hose and Rubber Co., Cambridgeport, Mass.
Cleveland-Canton Spring Co., Canton, Ohio.
Cleveland Wire Spring Co., Cleveland, Ohio.
Cook Spring Co., 247 Centre St., New York, N. Y.
D'Arcy Spring Co., 115 Main St., Kalamazoo, Mich. (Cushion.)
Gibson, The Wm. D. Co., 23-27 N. Clinton St., Chicago, Ill.
Hess-Pontiac Spring and Axle Co., Pontiac, Mich.
Jackson Cushion Spring Co., Jackson, Mich. (Seat and back.)
Kalamazoo Spring and Axle Co., Kalamazoo, Mich.
National Spring and Wire Co., Albion, Mich. (Spring edge cushion frames.)
Palmer, Jos., 361 Rutherford Ave., Boston, Mass.
Philadelphia Ornamental Wire Co., 628-630 Filbert St., Philadelphia, Pa.
Trenton Spring Mattress Co., Trenton, N. J. (Cushion.)
Windsor Spring Co., Kenosha, Wis. (Cushion.)
Wing, The Chas. Co., Amesbury, Mass. (Cushion.)

Spring Clips.

Seward, The M. & Son Co., Grant St., New Haven, Conn.

Sprockets (Automobile).

Boston Gear Works, 152 Purchase St., Boston, Mass.
Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cramp, The Wm., & Sons, S. and E. B., Beach and Ball Sts., Philadelphia, Pa.
Callman Wheel Co., 102 Dunning St., Chicago, Ill.
Forg, Peter, 50 Park St., Somerville, Mass.
Harris, E. T., 531-545 W. 15th St., Chicago, Ill.
Meisel Press and Mfg. Co., 944-948 Dorchester Ave., Boston, Mass.
Warner Gear Co., Muncie, Ind.

Sprockets (Cycle).

Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Forg, Peter, 50 Park St., Somerville, Mass.
Harris, E. T., 531-534 W. 15th St., Chicago, Ill.
Nelson, A., Mfg. Co., 67-69 S. Canal St., Chicago, Ill. ("Young's" Rim Sprocket.)
Parish and Bingham Co., Hamilton St. E. of Col., Cleveland, Ohio.
Spacke, The F. W. Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.

Stamping.

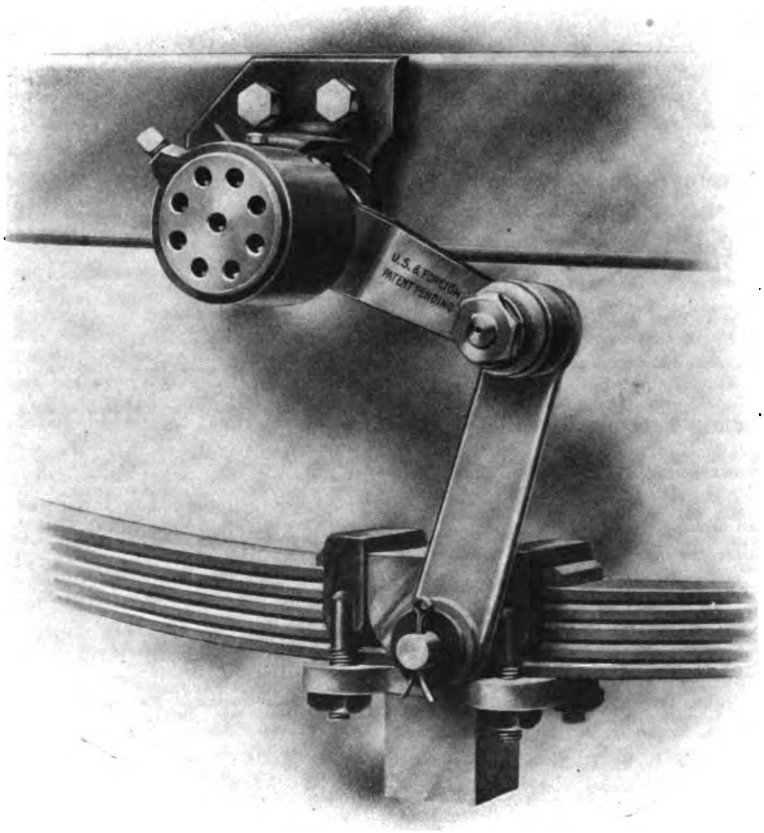
Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill.
Bay State Stamping Co., 3[illegible]0 Chandler St., Worcester, Mass.
Bliss, E. W. Co., Brooklyn, N. Y.
Bowen Mfg. Co., Canal St., Auburn, N. Y. (Brass and Steel.)
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.
Chandler Co., The, 31 Taylor St., Springfield, Mass. (Brass and steel.)
Clark, A. N & Son, Plainville, Conn. (Steel.)
Crosby Co., The, 177-187 Pratt St., Buffalo, N. Y.
Detroit Auto. Specialty Co., 12-14 Sherman St., Detroit, Mich.
Dover Stamping and Mfg. Co., 3[illegible]5 Putnam Ave., Cambridge, Mass.
Ellis, F. L. & Son, Milldale, Conn.
Forg, Peter, 50 Park St., Somerville, Mass.
Forsythe Mfg. Co., 308-314 Terrace, Buffalo, N. Y. (Special to order.)
Murdock, James, Jr., 116 Opera Place, Cincinnati, Ohio.
Midland Metal Co., Inc., 1427-33 Catherine St., Phila., Pa.
Parish & Bingham Co., Hamilton, E. of Coe Ct., Cleveland, Ohio.
Pope Mfg. Co., Hartford, Conn.
Smith, A. O. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Worcester Pressed Steel Co., Worcester, Mass.

Stationary Engines (Gas).

Beaver Mfg. Co., Milwaukee, Wis.
Crescent Machine and Tool Co., 220-222 South Pennsylvania St., Indianapolis, Ind.
Hall Bros. Gas Engine Works, 1120 Siegel St., Phila., Pa.
Holliday Mfg. and Engineering Co., 160 Bunker St., Chicago, Ill.
Kowalsky Engine Co., Verona, Pa. "Kowalsky Simplicity."
Olds Gasoline Engine Works, 251 River St., Detroit, Mich.
Peerless Motor Co., Lansing, Mich.
Phillips Motor Works, 133 La Salle St., Chicago, Ill.
Pierce Engine Co., The, Racine, Wis.
Pokorney, H., Automobile and Gas Engine Co., 1704 Bellefontaine St., Indianapolis, Ind.
Regal Gasoline Engine Co., Coldwater, Mich.
Rice, John V., Jr., & Co., Bordentown, N. J.

Stationary Engines (Gasoline).

Ayres Gasoline Engine and Automobile Works, Hamilton and Bristol St., Saginaw, W. S., Mich.
Bristol St., Saginaw, W. S., Mich.
Barker, C. L., Norwalk, Conn.
Beilfuss Motor Co., The, 223 Washington Ave., North Lansing, Mich.
Brown-Talbot Machinery Co., 438 Old South Building, Boston, Mass.
Cooley Mfg. Co., Waterbury, Vt.
Cornwall, The R. M. Co., 418-420 S. Salina St., Syracuse, N. Y.
Craig, James, 556 W. 34th St., New York City.
Crescent Machine and Tool Co., 220-222 S. Penna. St., Indianapolis, Ind.
Cross, M., Engine Co., Detroit, Mich.
Cushman Motor Co., 2020-2030 N. St., Lincoln, Neb.
Duluth Gas Engine Works, Duluth, Minn.
Enterprise Machine Co., 1112-20 S. Third St., Minneapolis, Minn.
Fairfield Motor Co., Fairfield, Conn.
Globe Iron Works Co., Menominee, Wis.
Goshen Motor Works, Goshen, Ind.
Hall Bros. Gas Engine Works, 1120 Seigel St., Philadelphia, Pa.
Hardy, The R. E. Co., 225 W. Broadway, N. Y. City.
Houle, A. J., 580 East St., Holyoke, Mass.
Hubbard Motor Co., Middletown, Conn.
Humphreys, F. J., Skaneateles, N. Y.
Jeffers, Warren H., 373 Canal St., N. Y. City.
McFadden Mfg. Co., Havana, Ill.
Mason, Wm. H., Mt. Carmel, Ill.
Merkel Motor Co., Layton Park, Milwaukee, Wis.
Olds Gasoline Engine Works, 251 River St., Detroit, Mich.
Peerless Motor Co., Lansing, Mich.
Pierce Engine Co., The, Racine, Wis.
Regal Gasoline Engine Co., Coldwater, Mich.
Rice, John V., Jr., & Co., Bordentown, N. J.
Schilling, C. R., 810 N. Main St., St. Louis, Mo.
Smith, Geo. D., Jr., Baldwins, N. Y.
Weeber, C. T., Mfg. Works, 255 Sherman St., Albany, N.Y.



RIDE ROUGH ROADS RIGHT

by equipping your automobile with the **Diezemann Shock Absorbor.** Not only does this device absorb the shocks which ordinarily rack springs, frame, engine and other working parts, but it makes a radical difference in the manner in which the automobile rides, and greatly adds to the pleasure of the occupants of the car.

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Dec. 2nd, '05.

The Diezemann Shock Absorber Co.,
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Hoboken, N. J.

Gentlemen:—

We have found the Diezemann Shock Absorbers satisfactory in every way, and doing all you claim for them, and have decided to use them in preference to any other make.

Yours very truly,
HOLLANDER & TANGEMAN.

Note this testimonial from one of the leading automobile houses in New York, and send for booklet containing many other testimonials.

THE DIEZEMANN is the only shock absorber which is absolutely correct in design, appearance and construction.

Diezemann Shock Absorber Co.
1311 Hudson St.,
HOBOKEN, - - N. J.

BUYER'S GUIDE—Continued

Stationary Engines (Kerosene).

Marine Engine and Machine Co., 126 Liberty St., New York, N. Y. "Secor."
Meitz, Aug., 128-138 Mott St., New York, N. Y.

Stationary Engines (Petroleum).

Tuck Petroleum Motor Co., 3rd Ave. and 22nd St., Brooklyn, N. Y.

Steam Auto Engines.

Boss Kniting Machine Works, cor. Elm and Reed Sts., Reading, Pa.
Clark, Edward S., 272-278 Freeport St., Boston, Mass.
Detroit Steam Engine Co., 404-405 Moffat Bldg., Detroit, Mich.
Dieter Steam Engine Co., 106 Liberty St., N. Y. City. "Dieter."
Grout Bros. Automobile Co., Orange, Mass.
Mason Regulator Co., 158 Summer St., Boston, Mass.
Monroe Engine Co., 35 Congress St., Boston, Mass. "Monroe."
Neustadt Auto. and Supply Co., 826-30 S. 18th St., St. Louis, Mo.

Steam Engine Fittings.

Ashcroft Mfg. Co., The, 85-87-89 Liberty St., New York, N. Y. (Recording gauges, speed recorders, steam engine indicators.)
Century Auto Power Co., East Orange, N. J.
Dart, E. M., Mfg. Co., 136 Clifford St., Providence, R. I. (Unions and flanges.)
Locke Regulator Co., Salem, Mass.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Powell, Wm., Co., 2525 Spring Grove Ave., Cincinnati, O. "Titan" and "Giant" Throttle Valve.
Spacke Machine Co., The F. W., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind. (Piston rings.)

Steam Vehicle Fittings.

Century Auto Power Co., East Orange, N. J. (Superheated steam throttle valve.)
Clum & Atkinson, Rochester, N. Y. (Couplings and unions.)
Columbus Brass Co., 43 N. 4th St., Columbus, O. (Brass fittings.)
Electric Contract Co., 202-4 Centre St., New York, N. Y. (Gauge glass, lamp and holder and electric torch.)
Grout Bros. Automobile Co., Orange, Mass. (Wheel throttle, down draft.)
Mannville, Johns, H. W., Co., 100 Williams St., New York, N. Y. (Asbestos boiler covering.)
Lane Motor Vehicle Co., Poughkeepsie, N. Y. (Automatic by-pass.)
Locke Regulator Co., Salem, Mass. (Water columns.)
Lunkenheimer Co., The, Cincinnati, O. (Water gauges, etc.)
Ofeldt & Son, F. W., Nyack, N. Y. (Water regulators, feed water heaters.)
Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. ("Sherwood's" automatic injectors, water columns, etc.)
Standard Gauge Mfg. Co., Syracuse, N. Y. (Gauges, safety valves and water gauges.)
Youse, E. S., 46 N. 5th St., Reading, Pa. ("Perfect" air coupling.)

Steel Castings.

Acme Steel and Malleable Iron Works, 245 Military Road, Buffalo, N. Y.
Adrian Steel Castings Co., Adrian, Mich.
Arcade Malleable Iron Co., Worcester, Mass.
Chrome Steel Works, Chrome, N. J.
Crucible Steel Castings Co., 612 Clinton St., Milwaukee, Wis.
Hoffman Hinge and Foundry Co., Cleveland, Ohio. (Semi-Steel.)
Johnson, Isaac G., & Co., Spuyten Duyvil, N. Y. City.
Kalamazoo Novelty Co., Kalamazoo, Mich.
Massachusetts Steel Casting Co., West Everett, Mass. (Carbon steel.)
Milwaukee Steel Foundry Co., Milwaukee, Wis.
The Naugatuck Malleable Iron Co., Naugatuck, Conn. (Semi steel.)
New Jersey Steel Co., Rahway, N. J.
Geo. H. Smith Steel Casting Co., Clinton St., Greenfield Ave. and Barclay St., Milwaukee, Wis.
Western Malleable Steel Co., Detroit, Mich.
Whiteley Steel Co., Muncie, Ind.

Steel Wire Belts.

McCord & Co., 84 Van Buren St., Chicago, Ill.
Philadelphia Ornamental Wire Co., 628-630 Filbert St., Phila., Pa.

Steering Apparatus (Auto

Automobile Supply Co., The, 1339 Michig
Chicago, Ill.
Barnes Gear Company, Oswego, N. Y.
Billings & Spencer Co., 216 Lawrence St., H
H. F. Borbein & Co., 2109 N. 9th St., St. L
Boston Gear Works, 152 Purchase St., Bosto
Brown-Lipe Gear Co., 208 S. Geddes St., Syr
Bultman, F. H., & Co., 35 W. Centre St.,
(Worms and sectors.)
Columbus Screw and Machine Co., The, 2
Columbus, Ohio.
Fast Machine and Tool Works, 1061-1063 29
waukee, Wis.
Garford Co., The, Elyria, O.
Gemmer Engine Co., Marion, Ind.
Harris, E. T., 531-545 W. 15th St., Chicago,
Lee Mfg. Co., The, South Park, Port Huro
contract.)
Morse, Williams & Co., West End Trust
delphia, Pa.
Muncie Auto Parts Co., Muncie, Ind.
Muncie Wheel and Jobbing Co., Muncie, Ind
Neustadt Auto and Supply Co., 826 S. 18th S
Mo.
Rogers, The Geo. D., Automobile Parts Mfg.
man St., Cleveland, Ohio. (Columns.)
Smith, A. O., Co., Park, Clinton and Virgi
waukee, Wis.
Sommer Motor Co., Box 138, Detroit, Mich.
Spacke, The F. W., Machine Co., Madison
and Penn Sts., Indianapolis, Ind.
Warner Gear Co., Muncie, Ind. "Warner."
Waugh, Arthur L., Cambridge, Mass.
Weeber, C. T., Mfg. Works, 255 Sherman, A

Steering Apparatus (Bo

Durkee, C. D., & Co., 2 South St., N. Y. C
Edson Mfg. Co., 255-257 Atlantic Ave., Bost
Morss, A. S., Co., 210-211 Commercial St., Bo

Steering Knuckles.

American Roller Bearing Co., S. Framingha
Gill & Sons Forge and Machine Works, P.
and Otsego Sts., Brooklyn, N. Y.
Hussey Drop Forge and Mfg. Co., Axtell S
Ohio.
Jamesville Mfg. Co., Jamesville, N. Y.
Ryman, K. L., Newark, N. J.
The Steel Ball Co., 832 Austin Ave., Chicag
Timken Roller Bearing Axle Co., Canton, O

Steering Levers.

Smith, A. O., Co., Park, Clinton and Virgin
waukee, Wis.

Steering Rods.

Billings & Spencer Co., 216 Lawrence St., Ha
Standard Welding Co., 35 Cone St., Cleveland

Steering Wheels (Auto

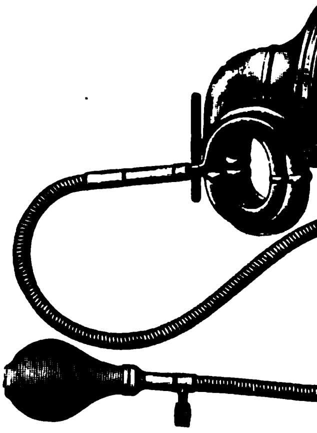
American Wood Rim Co., Onaway, Mich.
Auto Brass and Aluminum Co., Flint, Mich
Auto and Power Appliance Co., The, 357-359
Cleveland, Ohio.
Byrne, Kingston & Co., Kokomo, Ind.
Centaur Motor Co., 59 Franklin St., Buffalo,
Cramp, The Wm., & Sons, S. and E. B. Co.
Ball Sts., Philadelphia, Pa.
Goerss, Herman, 162 Russell Ave., Cleveland,
ing.)
Hussey Drop Forge and Mfg. Co., Axtell St.
Ohio.
Smith, A. O., Co., Park, Clinton and Virgini
waukee, Wis.
Warner Gear Co., Muncie, Ind.

Steering Wheels (Boat

Morss, A. S., Co., 210-211 Commercial St., Bo
Wilcox, Crittenden & Co., Middletown, Conn.

Steering Wheel Rims.

American Wood Rim Co., Onaway, Mich.
Tucker Wood Work Co., Sidney, Ohio.



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BUYER'S GUIDE—Continued

Steering Yokes.

Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
Cramp, The Wm., & Sons, S. & E. B. Co., Beach and Ball Sts., Philadelphia, Pa.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio.
Ryman, K. L., Newark, N. J.

Steps (Automobile).

Broc Carriage & Wagon Co., 417-21 Case Ave., Cleveland, Ohio.
Cleveland Hardware Co., Cleveland, Ohio.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
English and Mersick Co., New Haven, Conn.
Railway Appliances Co., 1175 Old Colony Building, Chicago, Ill. ("Q. & C." "Stanwood.")
Ryman, K. L., Newark, N. J.

Step Shanks.

Cleveland Hardware Co., Cleveland, Ohio. (Shanks.)

Storage Batteries.

American Battery Co., 172 S. Clinton St., Chicago, Ill.
Battery Power Co., 247-253 Madison St., Milwaukee, Wis.
Chicago Battery Co., Michigan Ave. and Fourteenth St., Chicago, Ill.
Chicago Pneumatic Tool Co., Fisher Bldg., Chicago, Ill.
The Columbia Battery Co., State and Third Sts., Milwaukee, Wis.
Curtis, F. G., 185 Milwaukee St., Milwaukee, Wis.
Dayton Elec. Mfg. Co., 609-612 Reibold Bldg., Dayton, O.
Dayton Mfg. Co., Dayton, Ohio. "Sylvie."
Edison Storage Battery Co., Glen Ridge, N. J.
Electric Storage Battery Co., 19th and Allegheny Ave., Philadelphia, Pa. "Exide" and "Chloride."
Gould Storage Battery Co., 1 W. 34th St., New York City.
Haschke Compound Storage Battery Co., The, 87 Ashland Boulevard, Chicago, Ill.
Helios Mfg. Co., Bridesburg, Pa.
Koener Accumulator Industrie, The, 276 Blackhawk St., Chicago, Ill.
Look Electric Co., The, 536-538 Wabash Ave., Chicago, Ill.
MacRae, H. O., 314 St. Paul St., Baltimore, Md. (Lighting.)
Michigan Storage Battery Co., Detroit, Mich.
National Battery Co., 368-82 Massachusetts Ave., Buffalo, N. Y. "Sperry."
New England Motor Co., 82 Fletcher St., Lowell, Mass.
Northwestern Storage Battery Co., 285 E. Madison St., Chicago, Ill.
Royal Battery Co., The, 143 Chambers St., N. Y. City. (National Sales Corporation, 256 Broadway, N. Y. City. Factory Sales Mgr.)
Smith Storage Battery Co., Zoar, Ohio.
Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City.
Tray Plate Battery Co., 5-11 Frederick St., Binghamton, N. Y.
Universal Electric Storage Battery Co., Railway Exchange, Chicago, Ill.
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill.
Western Storage Battery Co., Indianapolis, Ind.
Willard Storage Battery Co., 29 Academy St., Cleveland, Ohio. "Willard."
Witherbee Igniter Co., 541 W. 43rd St., N. Y. City.

Storage Battery Supplies.

Diamond Rubber Co., Akron, Ohio. (Hard Rubber Jars.)
Electric Rubber Mfg. Co., Rutherford, N. J. (hard rubber jars.)
Kalbfleisch, Frank H., Co., 31-35 Burling Slip, N. Y. City. (Battery fluids.)
Storage Battery Supply Co., The, 239 E. 27th St., New York, N. Y. (Rubber jars and cements.)
Witherbee Igniter Co., 541 N. 43d St., N. Y. City. (Acids and accessories.)

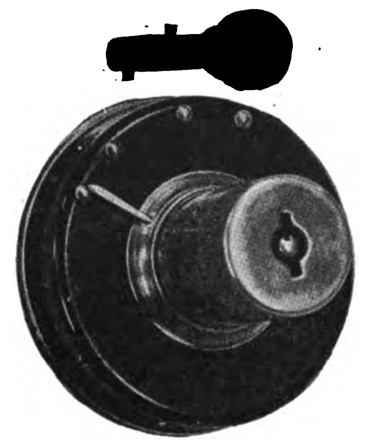
Store Lights.

Acorn Brass Mfg. Co., 56 Peoria St., Chicago, Ill.

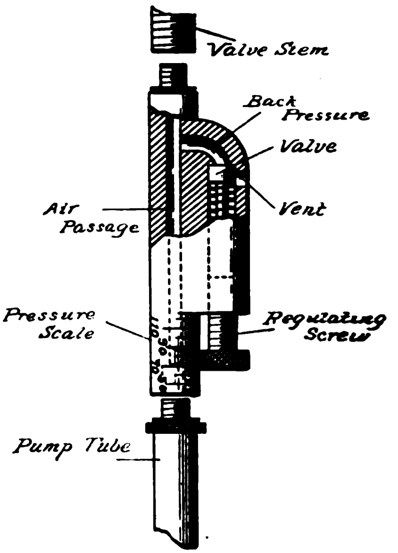
Storm Fronts.

Nathan Novelty Mfg. Co., 88-90 Reade St., N. Y. City.
Perfection Storm Shield Co., The, South Main St., Clyde, Ohio.
Warner Pole and Top Co., 1648 Centre St., Cincinnati, O.

Something New.



The switch that cannot be tampered with or operated except by its own plug, each switch having a different plug. No exposed terminals. Turning plug closes circuit. Turning of barrel connects batteries.



The instrument that accurately measures the pressures during inflation, or at any time it is desired to ascertain the pressure in the tire.

THE LOCK-SWITCH MANUFACTURING COMPANY
Exhibiting at Automobile shows. 20 Broad Street, New York

BUYER'S GUIDE—Continued.

Switches.

American Coil, Foxboro, Mass.
Atwater-Kent Mfg. Works, 42-46 North 6th St., Philadelphia, Pa.
Auto Lock Co., 6549 Minerva Ave., Chicago, Ill.
Auto Lock Plug Co., 31 Nassau St., N. Y. City. (Circuit breakers and cutout plug locks.)
B. & J. Mfg. Co., 1218-20 Michigan Ave., Chicago, Ill. "B. & J." (Lock.)
Centaur Motor Co., 59 Franklin St., Buffalo, N. Y.
Connecticut Telephone and Electric Co., Meriden, Conn. National Sales Corporation, 256 Broadway, N. Y. City. Factory Sales Mgr.
Dow Portable Electric Co., Braintree, Mass.
Eldredge Electric Mfg. Co., 227 Main St., Springfield, Mass.
Electric Contract Co., 202-4 Centre St., N. Y. City.
Goebel, F. A., Marietta, Ohio.
Hart & Hegeman Mfg. Co., The, 32 Union Place, Hartford, Conn.
Knoblock-Heideman, The, South Bend, Ind.
Kokomo Electric Co., The, Kokomo, Ind.
Lock Switch Mfg. Co., 20 Broad St., New York, N. Y. (Lock.)
McKibbon Mfg. Co., S. Norwalk, Conn.
More-Power Co., Box 175, Lowell, Mass.
Murdock, James, Jr., 116 Opera Place, Cincinnati, Ohio.
Parker Lock-Switch Co., The, Montclair, N. J.
Payne, J. W., Alexandria Bay, N. Y.
Peerless Machine Co., 124 Miami Ave., Detroit, Mich.
Pittsfield Spark Coil Co., Pittsfield, Mass.
Rajah Auto Supply Co., 140 Washington St., New York, N. Y.
Schug Electric Mfg. Co., Champlain and Beaubien Sts., Detroit, Mich.
Seidler-Miner Electric Co., 207-211 Jefferson Ave., Detroit, Mich.
Splitdorf, C. F., 23 Vandewater St., N. Y. City.
Utility Co., The, 235 Greenwich St., N. Y. City.
Weeber, C. T., Mfg. Works, 255 Sherman St., Albany, N. Y.
Willis, E. J., Co., 10 Park Place, New York, N. Y. "Yankee."

Tandem Attachments.

Hendee Mfg. Co., 216 Worthington St., Springfield, Mass.

Tanks (Auto).

A-Z Co., The, 462 Eleventh Ave., N. Y. City, N. Y.
American Generator Co., N. E. Cor. Park Ave. and 63rd St. (Combined tank and carburetors.)
Badger, E. B., & Sons Co., 63 Pitts St., Boston, Mass.
Briscoe Mfg. Co., 1429 Woodward Ave., Detroit, Mich.
Childs, S. D., & Co., 200 Clark St., Chicago, Ill. (Brass, steel or aluminum.)
Diamond Stamped Ware Co., Summit Ave., Detroit, Mich.
Fedders Mfg. Works, 1592-1594 Genesee St., Buffalo, N. Y.
Gleason-Peters Air Pump Co., 20 West Houston St., N. Y. City.
Gray, Peter, & Sons, 88-90 Union St., Boston, Mass.
Hayes Mfg. Co., 825-45 Maybury Grand Ave., Detroit, Mich.
International Non-Explosive Tank Co., 140 Nassau St., N. Y. City, N. Y.
Janney, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa. (Seamless steel.)
Kells, W. J., Mfg. Co., 62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co., Dayton, Ohio.
Lawrence, L., & Co., 292 Halsey St., Newark, N. J (Copper.)
Long-Turney Mfg. Co., Rome, N. Y.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Sands, A. B., & Co., 242 Water St., N. Y. City, N. Y.
Sexton Can Co., 2 Hartford St., Boston, Mass. (Special.)
Steel Ball Co., The, 832 Austin Ave., Chicago, Ill. (With attached alarm.)
Sun Stove Co., 1305 Bellevue Ave., Detroit, Mich.
Trageser, John, Steam Copper Works, 447 W. 26th St. N. Y. City, N. Y.

Telegraph System for Boats.

Cory, Chas., & Son, 278-279 Division St., N. Y. City.

1906

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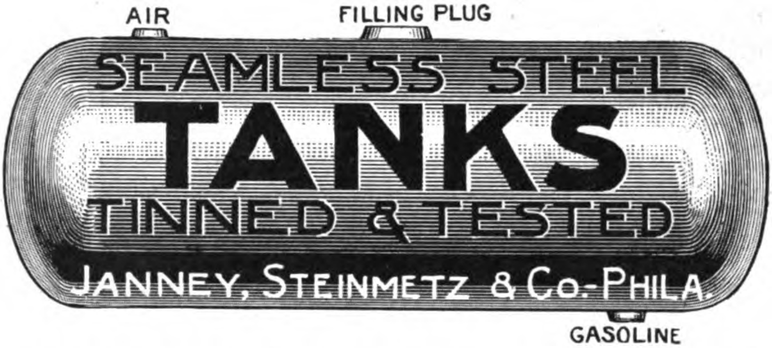
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can be put on any make of

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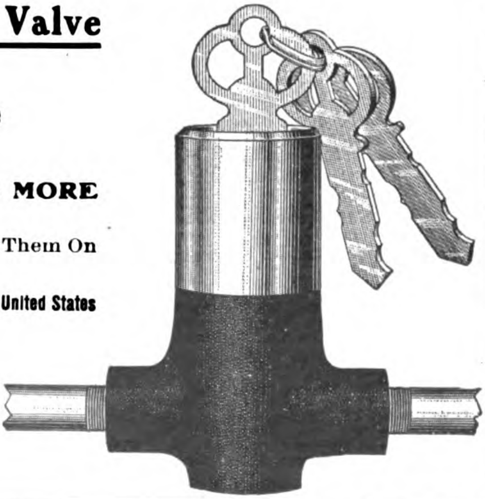


BUYER'S GUIDE—Continued.

Tanks (Boat).

Hydraulic Oil Storage and Distributing Co., 1002 Penobscott Building, Detroit, Mich.
International Non-Explosive Tank Co., 140 Nassau St., N. Y. City, N. Y.
Sands, A. B., & Sons Co., 242 Water St., N. Y. City, N. Y.

Terminals.

Bliss-Chester Co., 31 Mathewson St., Providence, R. I.
Briggs, W. H., 424 Bedford Ave., Brooklyn, N. Y.
Electric Contract Co., 202-4 Centre St., N. Y. City.
Herz & Co., 189 Elm St., N. Y. City.
Kokomo Electric Co., Kokomo, Ind.
Mosler, A. R., & Co., 1679 Broadway, N. Y. City.
Never-Miss Spark Plug Co., Lansing, Mich.
Noonan Tool and Machine Works, 103-105 Dominick St., Rome, N. Y.
Peerless Machine Co., 124 Miami Ave., Detroit, Mich.
Pittsfield Spark Coil Co., Pittsfield, Mass.
Shain, Chas. D., 70 Muray St., N. Y. City.
Springtight Terminal Co., Lansing, Mich.
Uncas Specialty Co., 21-37 Shipping St., Norwich, Conn.

Thermostats.

Century Auto Power Co., East Orange, N. J.

Throttle Valves

Century Auto Power Co., East Orange, N. J.

Timers.

Altemus, C. L., & Co., The Bourse Building, Philadelphia, Pa.
Atwater-Kent Mfg. Works, 42-46 N. 6th St., Philadelphia, Pa.
Auto Brass and Aluminum Co., Flint, Mich.
Auto Engine Works, St. Paul, Minn.
Bemus, T. Alton, 294 Washington St., Boston, Mass. "Duro."
Cambria Brass Mfg. Co., 41 Columbus Ave., Boston, Mass. "Barnes."
Continental Engine Co., cor. Kinsbury and Huron Sts., Chicago, Ill.
Crouse-Hinds Co., Syracuse, N. Y.
Dayton Electrical Mfg. Co., The, 609-12 Reibold Bldg., Dayton, Ohio. "King."
Dodge Lubricator Co., 36 Columbus St., Boston, Mass. National Sales Corporation, 256 Broadway, N. Y. City. Factory Sales Manager.
Dow Portable Electric Co., Braintree, Mass.
Fulmer, C. F., 415 Sycamore St., Plainfield, N. J.
Hardy, R. E., Co., 225 W. Broadway, N. Y. City. "Sta-Rite."
Herz & Co., 189 Elm St., N. Y. City.
Illinois Automobile and Parts Co., Maine and Globe Sts., Peoria, Ill.
Kokomo Electric Co., Kokomo, Ind.
Littlefield, H. A., & Co., 16 Avon St., West Lynn, Mass.
Milwaukee Auto Engine and Supply Co., 706 Winnebago St., Milwaukee, Wis.
Monitor Speed Recorder Co., 274 Pearl St., Cambridge, Mass.
Mosler, A. R., & Co., 1679 Broadway, N. Y. City.
Parker Lock-Switch Co., The, Montclair, N. J.
Pittsfield Spark Coil Co., Pittsfield, Mass.
Powell Mfg. Co., Utica, N. Y.
Rajah Auto Supply Co., 140 Washington St., New York, N. Y.
Ross & Kramer, 5607 S. Halsted St., Chicago, Ill.
Rubay, Leon, 140 West 38th St., N. Y. City.
Ryerson & Keyes, 2 W. Broadway, New York, N. Y.
Schug Electric Mfg. Co., Champlain and Beaubien Sts., Detroit, Mich.
Splitdorf, C. F., 23 Vandewater St., N. Y. City.
Uncas Specialty Co., 21-37 Shipping St., Norwich, Conn. "Leavitt."
Youse, E. S., 46 N. 5th St., Reading, Pa.

Time Recording Padlocks.

Phelps, The Guardiant Time Lock Co., 72 Cortland St., N. Y. City.

Tires (Automobile).

Ajax Standard Rubber Co., 420-430 E. 106th St., N. Y.
American Wood Tire Co., 911 Monadnock Building, Chicago, Ill. (Wood.)
Bailey, C. J., & Co., 22 Boyleston St., Boston, Mass. (Licensors) "Bailey Wont Slip."
Broadway Rubber Tire Co., 253 W. 47th St., N. Y. City.
Brown, Will H., Lennox Bldg., Cleveland, Ohio.
Consolidated Rubber Tire Co., 40 Wall St., N. Y. City. "Kelly-Springfield."
Continental Caoutchouc Co., 43 Warren St., N. Y. City. "Continental."
Continental Rubber Works, Erie, Pa.
Cooper, Dr. T. J., 114 Water St., Paterson, N. J.
Diamond Rubber Co., Akron, Ohio. "Diamond."
Electric Rubber Mfg. Co., Rutherford, N. J.
Firestone Tire and Rubber Co., Akron, O. "Firestone."
Fisk Rubber Co., Chicopee Falls, Mass. "Fisk" "Mechanically fastened."
G. & J. Tire Co., Indianapolis, Ind. "G. & J."
Gaulois Tire Co., 1739 Broadway, N. Y. City. "Gaulois" (Imported).
Goodrich, B. F., Co., Akron, O. "G. & J."
Goodyear Tire and Rubber Co., Akron, Ohio. "Ajax" and "Goodyear."
H. M. & S. Armored Tire Co., Pittsburg, Pa.
Hartford Rubber Works Co., Hartford, Conn. " ford," "Dunlop," "Turner."
Ideal Auto Tire Co., 1150 Fourteenth Ave., D Mich. "Ideal."
India Rubber Co., 16 Warren St., N. Y. City. "In
International Auto and Veh. Tire Co., Milltown, "International Fox Brand," "International ance," "International G. & J."
Kokomo Rubber Co., Kokomo, Ind.
Krotz Mfg. Co., Springfield, Ohio. (Cushion.)
May & Wells, 11 Abbott St., Detroit, Mich.
Mesinger, H. & F., Mfg. Co., 1801 First Ave., New York City. (Leather.)
Michelin Tire, American Agency, 6 W. 29th St., N. Y. City. "Michelin" (Imported).
Mitchell Punctureless Pneumatic Tire Co., 324 Essex St., Swampscott, Mass.
Morgan & Wright, 331-339 W. Lake St., Chicago, Ill.
Motz Clincher Tire and Rubber Co., Akron, Ohio.
Palmer, H. A., 54 Fay St., Akron, Ohio. (Mechanically fastened.)
Pennsylvania Rubber Co., Jeannette, Pa.
Potts, W. O., 321 Broad St., Harrisburg, Pa.
Republic Rubber Co., Youngstown, Ohio.
Rubber Tire Co., 1215 Arch St., Philadelphia. " tina" (Cellular.)
St. John Rubber Tire Co., 116 Broad St., New City. (Cushioned.)
Salisbury Tire Association, Owosso, Mich.
Samson Tire Co., 12 W. 33d St., New York, N. Y.
Single Tube Auto and Bic Tire Co., 253 Broadway, York. (Licensors under Tillinghast Patents.)
Swinehart Clincher Tire and Rubber Co., Akron, O.
Tennant Auto Tire Co., 131 W. Main St., Spring
The Universal Tire Co., 623 St. James Bldg., N. Y. (Cushion.)
Voorhees Rubber Co., 303 W. 54th St., N. Y. C
Western Rawhide Belting Co., 7th and National Milwaukee, Wis. Leather.

Tire Brackets.

Gilbert Mfg. Co., New Haven, Conn.

Tires (Cycle).

Bailey, C. J., & Co., 22 Boyleston St., Boston, Mass. (Licensors) "Bailey Wont Slip."
Boston Woven Hose and Rubber Co., Cambridgeport, Mass.
Continental Rubber Works, Erie, Pa.
Diamond Rubber Co., Akron, Ohio. ("Hunter," "[illegible]," "Ixion," "Puncture Proof," "XX," "Reliance Puncture Proof," "Niagara," "Diamond 1900," "Extra A."
Fisk Rubber Co., Chicopee Falls, Mass. ("Fisk.")
G. & J. Tire Co., Indianapolis, Ind. "G. & J." (Also motor cycle.)
Goodrich Co., B. F., Akron, Ohio. ("Goodrich," "Palmer," "G. & J.," "Buckeye," "M. & W.")
Goodyear Tire and Rubber Co., Akron, Ohio. ("Goodyear" (and motor cycle.)
Hartford Rubber Works Co., Hartford, Conn. ("Dunlop.")
India Rubber Co., 16 Warren St., N. Y. City.
International Auto and Vehicle Tire Co., Milltown, N. J. ("Endurance Cushion Pneumatic," "International Chase Tough Tread," "A. A.," "B. B.," "Chase Roadster," "Newton Roadster," "National," "Thorn," "Continental," "Hummer," "Imperial," "Metropolitan," "Kensington," and "Metropolitan Juvenile.")
Kokomo Rubber Co., Kokomo, Ind. ("Kokomo," "Defender," "Cloverleaf," "Oxford.")
Miller, Chas. E., Anderson, Ind. (Solid.)
Milwaukee Rubber Works Co., Cudahy, Wis.
Pennsylvania Rubber Co., Jeanette, Pa.
Rubber Tire Co., The, 1215 Arch St., Philadelphia, Pa. ("Lattina," "Cellular.")
St. John Rubber Tire Co., 116 Broad St., N. Y. City (Cushioned.)
Single Tube Auto and Bicycle Tire Co., 253 Broadway, N. Y. City. ("Licensors under Tillinghast Patents.)
Tennant Auto Tire Co., 131 W. Main St., Springfield, (Motor cycle.)

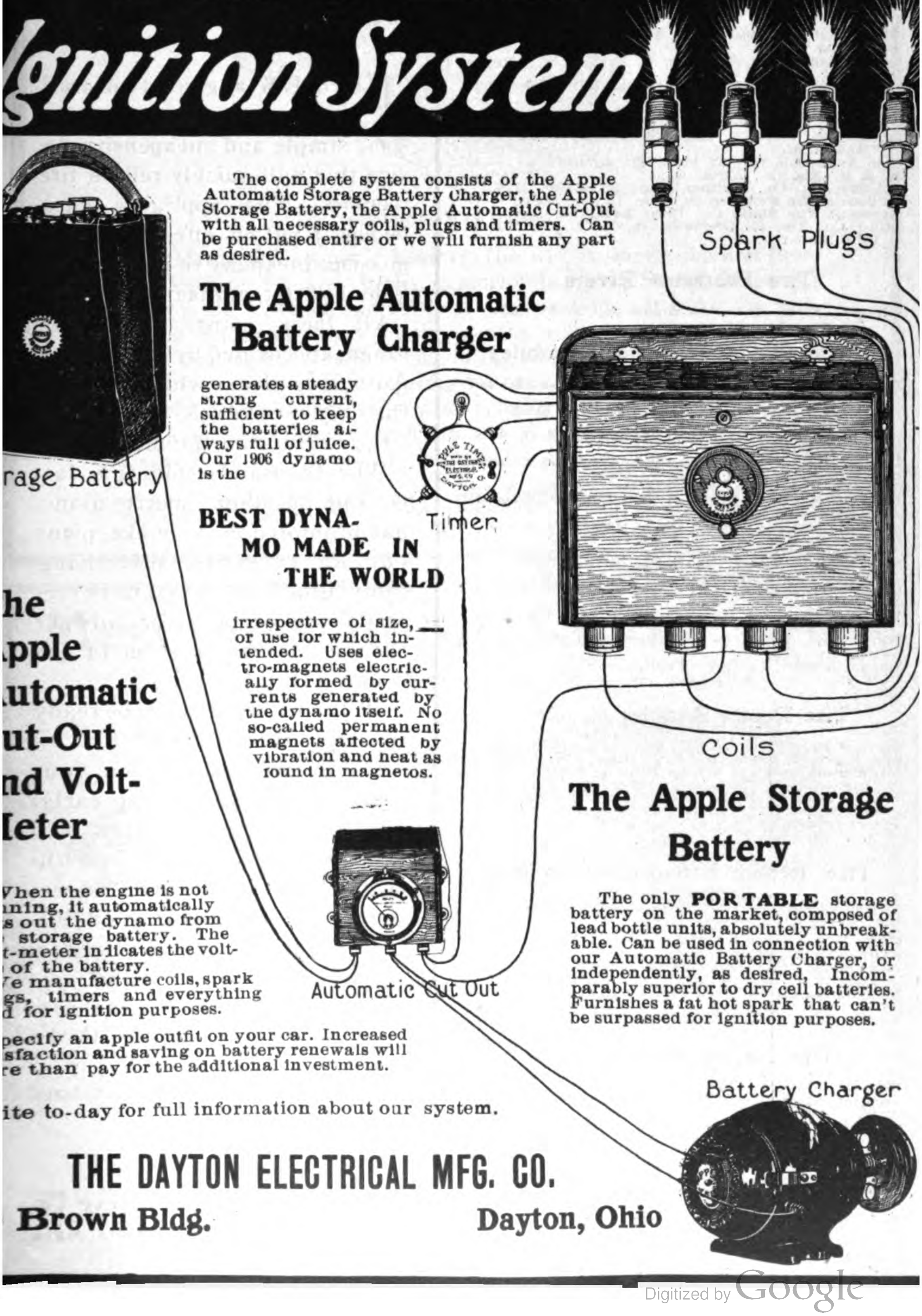
Tire Cases.

Burgin Bros., 15 Market St., Springfield, Mass.
Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
Gilbert Mfg. Co., New Haven, Conn.
London Auto Supply Co., 1229-31 Michigan Ave., Chicago, Ill.
Nathan Novelty Mfg. Co., 88-90 Reade St., N. Y. City.
Teel, E., & Co., Medford, Mass.
Vehicle Apron & Hood Co., 198 E. Rich St., Columbus, Ohio.
Wm. H. Wiley Co., The, Box 78, Hartford, Conn.

Tire Inflaters (Mechanical).

Auto. Pump Co., Springville, N. Y.
Bonnett, J. C., 43 Gregory St., New Haven, Conn.
Gas Engine Whistle Co., 1133 Broadway, N. Y. City, N. Y.
McCord & Co., 84 Van Buren St., Chicago, Ill.
Motor Car Specialty Co., 143 E. State St., Trenton, N. J.
Pacific Tucking and Mfg. Co., 471 18th St., Brooklyn, N. Y.

The APPLE for 1906 Ignition System



The complete system consists of the Apple Automatic Storage Battery Charger, the Apple Storage Battery, the Apple Automatic Cut-Out with all necessary coils, plugs and timers. Can be purchased entire or we will furnish any part as desired.

The Apple Automatic Battery Charger

generates a steady strong current, sufficient to keep the batteries always full of juice. Our 1906 dynamo is the

BEST DYNAMO MADE IN THE WORLD

irrespective of size, or use for which intended. Uses electro-magnets electrically formed by currents generated by the dynamo itself. No so-called permanent magnets affected by vibration and heat as found in magnetos.

The Apple Storage Battery

The only **PORTABLE** storage battery on the market, composed of lead bottle units, absolutely unbreakable. Can be used in connection with our Automatic Battery Charger, or independently, as desired. Incomparably superior to dry cell batteries. Furnishes a fat hot spark that can't be surpassed for ignition purposes.

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nd Volt-
Ieter

Vhen the engine is not
nning, it automatically
s out the dynamo from
storage battery. The
t-meter indicates the volt-
of the battery.
Ve manufacture coils, spark
gs, timers and everything
d for ignition purposes.

pecify an apple outfit on your car. Increased
sfaction and saving on battery renewals will
re than pay for the additional investment.

ite to-day for full information about our system.

THE DAYTON ELECTRICAL MFG. CO.

Brown Bldg. **Dayton, Ohio**

BUYERS' GUIDE—Continued

Tire Pressure Registers.

Lock Switch Mfg. Co., 20 Broad St., N. Y. City.
Wray Pump and Register Co., Rochester, N. Y.

Tire Protectors.

Adwear Auto Tire Sleeve Co., The, N. Attleboro, Mass. "Adwear."
Empire Rubber Mfg. Co., The, P. O. Box 34, Trenton, N. J.
Gilbert Mfg. Co., New Haven, Conn. (Tire bands and sleeves.)
Harmon Mfg. & Distributing Co., 289 N. Carpenter St., Chicago, Ill.
Leather Tire Goods Co., The, Newton Upper Falls, Mass. "Woodworth."
Lynn Automobile Co., 274 Broad St., Lynn, Mass.
M. & M. Mfg. Co., Akron, Ohio.
Manning Mfg. Co., Whitney Bldg., Springfield, Mass.
Pneumatic Tire Protector Co., The, Dayton, Ohio.
Pneumatic Tire Shield Co., Cedar Rapids, Iowa.
Utility Co., The, 235 Greenwich St., N. Y. City, N. Y. (Tire bands.)

Tire Protector Rivets.

Stimpson, E. B., & Son, 31 Spruce St., N. Y. City.

Tire Repair Articles (Automobile).

Barrett Mfg. Co., Philadelphia, Pa. (Benzols and napthas.)
Chicago Raw Hide Mfg. Co., 75-77 Ohio St., Chicago, Ill. (Tire patches and tire sleeve.)
Continental Caoutchouc Co., 43 Warren St., N. Y. City. (Tire accessories.)
Diamond Rubber Co., Akron, Ohio. Plugs and rubber.
Fisk Rubber Co., Chicopee Falls, Mass.
International Auto and Veh. Tire Co., Milltown, N. J.
The Leather Tire Goods Co., Newton Upper Falls, Mass. (Emergency straps.)
M. & M. Mfg. Co., Akron, Ohio. (Inner tube splicers.)
Mesinger, H. & F. Mfg. Co., 1801 First Ave., N. Y. City. (Repair bands.)
National India Rubber Co., Bristol, R. I. (Tape.)
Newmastic Tire Co., 3968 Olive St., St. Louis, Mo.
Rubber Goods Repair Co., 89 16th St., Chicago, Ill. (Patches.)
Tingley, Chas. O., & Co., Rahway, N. J. Rubber plugs and patches.
Willis, E. J., & Co., 10 Park Place, N. Y. City (Plaster.)
Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

Tire Repair Articles (Cycle).

Diamond Rubber Co., Akron, Ohio. (Plugs and rubber.)
Fisk Rubber Co., Chicopee Falls, Mass.
International Auto and Vehicle Tire Co., Milltown, N. J. (Patching and Vulvanizing rubber.)
Tingley, Chas. O., & Co., Rahway, N. J. (Rubber plugs and patches.)
Young, Orlando W., 174-80 Frelinghuysen Ave., Newark, N. J.

Tire Repair Kits (Automobile).

Continental Caoutchouc Co., 43 Warren St., N. Y. City.
Diamond Rubber Co., Akron, Ohio.
Goodrich, B. F., Co., Akron, Ohio.
Goodyear Tire and Rubber Co., Akron, O.
Hartford Rubber Works Co., Hartford, Conn.
International Automobile and Vehicle Tire Co., Milltown, N. J.
National Cement and Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
Tingley, Chas. O., & Co., Rahway, N. J.

Tire Repair Kits (Cycle).

Diamond Rubber Co., Akron, Ohio.
Excelsior Supply Co., 233 E. Randolph St., Chicago, Ill. "Famous."
Goodrich, B. F., Co., Akron, Ohio. "Jiffy."
Goodyear Tire and Rubber Co., Akron, O.
Hartford Rubber Works, Hartford, Conn. "Hartford & H. C."
International Automobile and Vehicle Tire Co., Milltown, N. J.

Tire Repair Liquids.

Buffalo Specialty Co., 375 Ellicott St., Buffalo, N. Y. ("Neverleak" Auto and Cycle.)

Why Live Dealers Should Sell Adwear Sleeves

THERE'S a great demand among Auto owners for some simple and inexpensive device that will quickly relieve tire troubles. The appliance must be easily put on, effective in its mission, inexpensive and serviceable, but not cumbersome.

All these points and many others are covered by the Adwear Auto Tire Sleeve which is really the only serviceable and perfect tire protector on the market.

The thousands sold this last season, on their merit alone, has prompted us to make plans for an extensive advertising campaign, that is certain to create a big demand for Adwear Sleeves in every section of the country.

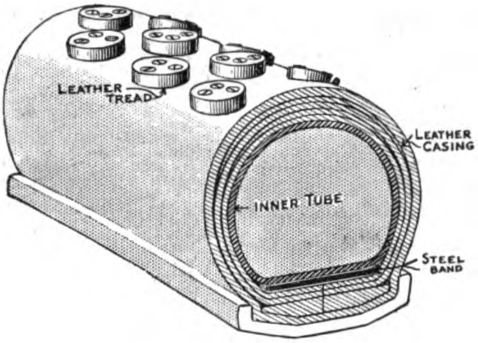
Will you, Mr. Dealer, be ready to supply this demand?

Put Adwear Sleeves on your list of sundries, stock up early. Inquiries from your section will be turned your way and our liberal "ask your dealer" advertising will send many good dollars rolling into your money drawer.

Remember there's one real serviceable tire protector—that's the Adwear Tire Sleeve.

Write to-day for prices and discounts.

The Adwear Auto Tire Sleeve Co.
"Dept. D." **North Attleboro, Mass.**



Patented May 23, 1905.

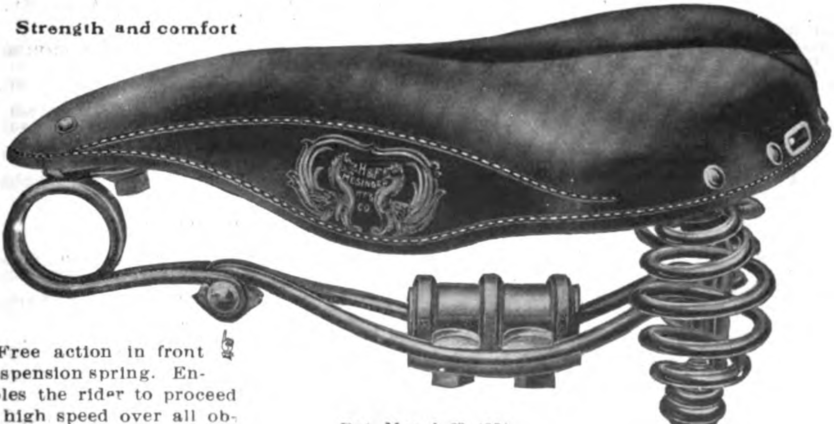
The Mesinger Pneumatic Leather Tire will be shown the first time in the Madison Square Garden Automobile Show, Second Balcony, Space No. 205. Come and see us for information, It is not an experiment, but being tested for six months, running over 1000 miles without causing any obstructions, during which time the tire ran deflated for 15 miles without injuring the casing. One nut fastens tire to the rim with a connecrion of a steel band. The tread is covered with leather disks fastened with screws and can be renewed when they are worn off. Correspondence invited.

H. & F. MESINGER MFG. CO., 1801-1807 First Avenue, New York

Mesinger Motor Saddle 1906

The ORIGINAL American Motor Saddle

Strength and comfort



Free action in front suspension spring. Enables the rider to proceed at high speed over all obstructions.

Pat. March 29, 1904.

MODEL "AA"

The only coil hair padded suspension saddle. Two telescope springs in the rear makes comfortable riding on rough roads. Makes Motor Cycling more Tractable.

H. & F. MESINGER MFG. CO., 1801-1807 First Ave., New York

BUYERS' GUIDE—Continued

Tire Repair Tape.

Boston Woven Hose and Rubber Co., Cambridgeport, Mass.
Goodrich Co., B. F., Akron, Ohio. (Tire tape and emergency bands.)
Goodyear Tire and Rubber Co., Akron, Ohio.
Mass. Chemical Co., Walpole, Mass.
National Cement and Rubber Mfg. Co., 3053-59 Monroe So., Toledo, Ohio.
Tingley, Chas. O., & Co., Rahway, N. J.

Tire Repair Tools (Automobile).

Automobile Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City.
Blanchard, A. W., 10 Clinton St., Brooklyn, N. Y. "Blanchard" Tire Detacher.
Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. (Neverleak injector.)
Diamond Rubber Co., Akron, Ohio.
Duane, W. J., & Co., 1771 Broadway, N. Y. City. (Tire irons.)
Elliott, W. J., & Co., 185 Franklin St., Boston, Mass. (Tire remover.)
Goodrich, B. F., Co., Akron, Ohio.
Goodyear Tire and Rubber Co., Akron, Ohio.
International Auto and Veh. Tire Co., Milltown, N. J.
Noonan Tool and Mach. Works, 103½-105 Dominick St., Rome, N. Y.
Rhodes Mfg. Co., The, Grand Rapids, Mich. (Tire remover.)
Shawver Co., The, Springfield, Ohio. (Tire remover.)
Teel, E., & Co., Medford, Mass.
"Uneedme" Tool Co., 61 E. Spring St., Columbus, O. "Uneedme."

Tire Repair Tools (Cycle).

Goodrich Co., B. F., Akron, Ohio. ("Jiffy.")
International Auto and Vehicle Tire Co., Milltown, N. J.
Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y.

Tire Valves (Automobile).

Buck, L. K., Freehold, N. J.
Eastern Auto Appliance Co., Room 23, Journal Bldg., Boston, Mass.
Milwaukee Rubber Works Co., Cudahy, Wis.
Schrader's, A., Sons, Inc., 28-32 Rose St., N. Y. City.

Tire Valves (Cycle).

Milwaukee Rubber Works Co., Cudahy, Wis.

Tire Valve Stems (Cycle and Auto).

Continental Rubber Works, Erie, Penna.
Crescent Forgings Co., Oakmont, Pa.
Goodrich, B. F., Co., Akron, Ohio.
International Auto and Veh. Tire Co., Milltown, N. J.

Toe Clips.

Cole, G. W., Co., 143 Broadway, N. Y. City.
Standard Co., The, Torrington, Conn.
Theim Mfg. Co., The, Columbia Heights, Minn.

Tools.

Atlas Machine Co., 12 Beverley St., Providence, R. I. (Tap extractor.)
Bay State Stamping Co., 380 Chandler St., Worcester, Mass. Emery wheel dressers, turning tools.
Boyle, John, & Co., 112-114 Duane St., New York City. (Repair outfits.)
Briggs, W. H., 424 Bedford Ave., Brooklyn, N. Y. (Chain tightener.)
Brown, J. O., Mfg. Co., Butler, Ind. (Rachet chain tool.)
Brown & Sharpe Mfg. Co., Providence, R. I. Measuring tools.
Clough, R. M., L. B. 196, Tolland, Conn. (Adjustable shell reamer and special tools.)
Cook's Railway Appliance Co., Kalamazoo, Mich. (Tool grinder.)
Crane & Richardson, 112 Water St., Boston, Mass. (Fly wheel puller.)
Crowell, Gilmer, 294-296 Graham St., Brooklyn, N. Y. (Blowers for brazing.)
Davis, Frank M., & Co., 935 30th St., Milwaukee, Ill. (Micrometer calipers.)
Dixon, Jos., Crucible Co., Jersey City, N. J. (Brazing crucibles.)
Essex Mfg. & Supply Co., Newark, N. J. (Bearing scraper.)
Forg, Peter, 50 Park St., Somerville, Mass. (Tube expanders.)
Forsyth Mfg. Co., 308-14 Terrace St., Buffalo, N. Y. (Dies and tools to order.)
Gay, E. L., 74 Main St., Southbridge, Mass. (Gear, cam and flywheel remover.)
Ginter, J. M., Wooster, Ohio. (Hoists and cranes.)
Hammacher, Schlemmer, & Co., 13th St. and Fourth Ave., N. Y. City "Tourist Autokit."
Harris, E. T., 531-545 W. 15th St., Chicago, Ill. (Hack saws.)
The Hatcher Auto Parts Co., 138 Viaduct, Cleveland, Ohio. (Crimping.)
Haves File Co., Detroit, Mich. (Files.)
Kilbourn & Bishop Co., New Haven, Conn. (Cold chisels, bits.)
Manning, Maxwell & Moore, 85-89 Liberty St., New York City.
Marshall & Huschart Machinery Co., 62-64 S. Canal St., Chicago, Ill. (Hammers, punches, shears and saws.)
Meisel Press and Mfg. Co., 944 Dorchester Ave., Boston, Mass. (Size blocks.)
Miller Falls Co., 28 Warren St., New York City. ("Star" hack saws.)
Morse Twist Drill & Machine Co., New Bedford, Mass. (Taps, cutters, taper pins, counter bores, mandrels.)
The Motor Car Supply Co., 1427 Michigan Ave., Chicago, Ill. Little "Husky" chain tools.
Myers Mfg. Co., 67 Wabash Ave., Chicago, Ill. (Convertible machine tools.)
Nafew, Samuel, 335 Broadway, N. Y. City. (Hand punch.)
Never-Miss Spark Plug Co., Lansing, Mich. (Chain repairer.)
New England Cycle Supply Co., Keene, N. H. (Rim spacer, rim drill, wheel assembling chuck.)
Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y. (Valve pliers, cutter pin removers, crank swage, chain repair tools, inner tube testers, inner tube removers, auto chain repair clamps, hand forged tools, soft face vise jaws.)
Patterson, Gottfried, & Hunter, Ltd., 146-150 Centre St., New York City. (Small.)
Prentiss Vise and Tool Co., New York City. (Punches and shears.)
Pres. Mfg. Co., Cleveland, Ohio. (Spark plug brush.) "Presco."
Reese Co., E. F., Greenfield, Mass. (Screw plates and tap wrenches.)
Rogers Mfg. Co., 147 W. 23d St., N. Y. City. (Hand punch.)
Simmonds Hardware Co., 173 Duane St., N. Y. City. (Tool kits.)
Standard Tool Co., Cleveland, Ohio.
Starrett, L. S., Co., Athol, Mass. (Shaft speed indicator.)
Universal Tool Co., 54 Taylor St., Springfield, Mass. (Combination.)
Utica Drop Forge and Tool Co., 75 Genesee St., Utica, N. Y. (Nippers.)
Van Benschoten, John, 14-20 Catherine St., Poughkeepsie, N. Y. (Clipper grinder.)
Wagner Motor Cycle Co., 327 St. Peter St., St. Paul, Minn. (Truing and Assembly Device.)
West Haven Mfg. Co., West Haven, Conn. (Hack saws.)
The Yale & Towne Mfg. Co., 9-15 Murray St., N. Y. City. (Chain and electric hoist.)

BRAZING AND SOLDERING TORCHES.

Kaufman, The A. G., Mfg. Co., 24-26 Murray St., N. Y. City.
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. ("High Pressure" and "Red Cross.")
Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y. (Crank removers.)
The Turner Brass Works, Franklin and Michigan Sts., Chicago, Ill.

DIES AND TAPS.

Besly, Chas. H., & Co., 15-21 S. Clinton St., Chicago, Ill.
Carpenter, J. M., Tap and Die Co., Pawtucket, R. I. (Also die stocks.)
Geometric Tool Co., Westville Station, New Haven, Conn.
Pratt & Whitney Co., 111 Broadway, N. Y. City.
Reece, E. F., Co., Greenfield, Mass.
Standard Tool Co., Cleveland, Ohio.
F. E. Wells & Son Co., Greenfield, Mass. (Pipe dies.)

VISES.

Atlas Machine Co., 12 Beverly St., Providence, R. I.
The Vanderbeek Tool Co., Hartford, Conn.

WHEEL TRUERS.

Noonan Tool and Machine Works, 103½-105 Dominick St., Rome, N. Y.

Tool Bags (Cycle).

Indian Motor Cycle Co., 258 Columbus Ave., Boston, Mass. (Motor cycle.)
Wolverine Leather Goods Co., Detroit, Mich.

We believe that a very large portion of the tire-trouble suffered by motorists is due to their ignorance in regard to the care and proper manipulation necessary for the preservation of motor-tires.

We also believe that, with the proper encouragement and instruction from the Manufacturer, the Driver of a Car can materially reduce his tire-expense which is now so large an item in the cost of operation.

We have, therefore, decided to offer cash prizes to the amount of

$1000.00

for a **Tire Economy Competition** to continue throughout the year 1906.

Every Owner or Driver of a motor-car is eligible to enter this contest.

The prizes will be awarded according to the tire-expense per running mile. Contestants may enter at any time during the year, but must complete 2500 miles before the close of the competition.

We will forward particulars of this Competition and instructions for the care of tires on request.

Pennsylvania Rubber Co.

Jeannette, Pa.

BUYER'S GUIDE.—Continued.

Tool Bags and Rolls (Automobile).

Gilbert Mfg. Co., New Haven, Conn. (Roll.)
Nathan Novelty Mfg. Co., 88-90 Reade St., N. Y. City. (Roll.)
Troxel Mfg. Co., Elyria, Ind.
Vehicle Apron and Hood Co., 198 E. Rich St., Columbus, O.
Wiley, The Wm. H., & Son Co., Box 78, Hartford, Conn.

Tops (Automobile).

American Top Co., Jackson, Mich.
Automobile Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City.
Auto Top and Specialty Co., Broadway and 63d St., N. Y. City.
Baltimore Buggy Top Co., The, 700-2 Penna. Ave., Baltimore, Md.
Barndt-Johnston Auto Sup. Co., The, Columbus, Ohio.
Bauer Bros. Mfg. Co., 937-41 W. 8th St., Cincinnati, O.
Briggs Carriage Co., Amesbury, Mass.
Brock Carriage and Wagon Co., The, 417-21 Cass Ave., Cleveland, Ohio.
Brouse, W. E., & Co., 47 Vincent St., Cleveland, Ohio.
Buob & Scheu, Court St. and Broadway, Cincinnati, O.
Cartier-Chapman & Co., Ludington, Mich.
Central Mfg. Co., Connersville, Ind.
Coleman, Prouty & Root, 234-38 Jefferson Ave., Detroit, Mich.
Collins Buggy Co., Akron, Ohio. (Canopy.)
Denniston, E. E., 184 W. Mohawk St., Buffalo, N. Y.
Detroit Carriage Co., Detroit, Mich.
Detroit Motor Car Supply Co., 1256 Jefferson Ave., Detroit, Mich.
Duane, W. J., & Co., 1771 Broadway, N. Y. City. (Canopy.)
Eclipse Buggy and Carriage Co., Fort Wayne, Ind.
Empire Gear and Top Co., 413 N. 22d St., Philadelphia, Pa.
Everitt, B. F., 63-65 Fort St., E. Detroit, Mich.
Fellwock Autotop Co., The, Evansville, Ind.
Frazier, W. S., & Co., Aurora, Ill.
Halliday, C. A., 42 Cedar St., Oneida, N. Y.
Hill Mfg. Co., The, 1394-96 West Ave., Buffalo, N. Y.
Holcomb, H. C., 105 Goffe St., New Haven, Conn.
Indianapolis Dash Co., The, Indianapolis, Ind.
Kimball, C. P., Co., 315-17 Mich. Ave., Chicago, Ill.
King Mfg. and Garage Co., Springfield, Ohio.
Kroh, O. Z., Mfg. Co., 120 St. Clair St., Toledo, O.
Lane, Thos. W., Chestnut St., Amesbury, Mass.
Limousine and Carriage Mfg. Co., 323-25 E. 35th St., Chicago, Ill.
London Auto Supply Co., 1229-31 Mich. Ave., Chicago, Ill.
McClellan, Chas. T., Fall River, Mass.
Michigan Top Co., 15-17 Duffield St., Detroit, Mich.
Meyer, C. G., Tiffin, Ohio.
Moore & Munger Co., 602 W. 52d St., N. Y. City.
Morton, Robert E., 26 South St., N. Y. City.
Myers-Dayton Top Co., The, 1109-11 E. 5th St., Dayton, Ohio.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
Newton, W. H., & Son, Cortland, N. Y. (Excelsior.)
New York Automobile Exch., 154 E. 57th St., N. Y. City.
Quimby, J. N., & Co., 1534 Broadway, N. Y. City.
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich.
Rex Upholstering Top Co., Columbus, Ohio.
Ritter Mfg. Co., Detroit, Mich.
Russell, H. J., Worcester, Mass.
Schildwachter Carriage Co., 128th St. and Park Ave., N. Y. City.
Schubert Bros. Gear Co., Oneida, N. Y.
Snow, N. H., & Co., 26 Hawley St., Binghamton, N. Y.
Sprague Umbrella Co., Norwalk, Conn. ("Sprague.")
Springfield Auto Top and Upholstering Co., 102-6 Dwight St., Springfield, Mass.
Springfield Metal Body Co., Brightwood, Springfield, Mass.
Teel, E., & Co., Medford, Mass.
Weiss, Chas., 4725 Cottage Grove Ave., Chicago, Ill. (Canopy.)

Top Fabrics.

Carr, F. S., 74 Pearl St., Boston, Mass. ("Kokuk" fabrics and mackintosh material.)
Fairfield Rubber Co., The, Fairfield, Conn.
Hodgman Rubber Co., 806 Broadway, N. Y. City.
Manufacturers' Selling Co., 1777 Broadway, N. Y. City. (Water proof.)
Mutty, L. J. Co., Boston, Mass. (Mackintosh and rubber surface, cloths and artificial rubber.)
Pantasote Co., 11 Broadway, N. Y. City.
Roehm & Davison, Ltd., Detroit, Mich.

Top Parts (Automobile).

Automobile Cover and Top Mfg. Co., 148 W. 56th St., N. Y. City. (Goose necks.)
Cleveland Hardware Co., Cleveland, Ohio. (Canopy and seat irons, canopy sockets.)
Cortland Forging Co., Cortland, N. Y. (Joints, shifting rails, canopy top standard.)
English & Mersick Co., New Haven, Conn.
Neider, F. A., Co., Augusta, Ky. (Buttons and steel knobs.)
Rands Mfg. Co., 51-55 Macomb St., Detroit, Mich. (Body irons.)
Ritter Mfg. Co., Detroit, Mich. (Irons.)
Roehm & Davison, Ltd., Detroit, Mich.
Smith, Jos. N., Co., 4th and Porter Sts., Detroit, Mich. ("Reliable," canopy top standards.)

Transfers (Ornamental).

Meyercord Co., The, Chamber of Commerce Bldg., Chicago, Ill.

Transmission Devices.

Aster Co., 1591 Broadway, N. Y. City.
Automatic Clutch Co., Hamilton Building, Akron, O.
Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.
Auto Front Drive Mfg. Co., 2821 Easton Ave., St. Louis, Mo. (Front drive.)
Automobile, The, Supply Co., 1339 Michigan Boulevard, Chicago, Ill.
Belden Auto Transmission Co., Bessemer Building, Pittsburg, Pa.
Berkshire Auto Co., Renne Ave., Pittsfield, Mass.
Beverly Mfg. Co., Beverly, Mass. "Upton."
Blood Bros. Auto and Mach. Co., 114 N. Edwards St., Kalamazoo, Mich.
Boston Gear Wks., 152 Purchase St., Boston, Mass.
Brennan Motor Co., 101 Grape St., Syracuse, N. Y.
Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y.
Bultman, F. H., & Co., 35 W. Centre St., Cleveland, O. (To order.)
Burtt Mfg. Co., 124-130 N. Edwards St., Kalamazoo, Mich.
Champion Mfg. Co., 9-15 Alling St., Newark, N. J. "Champion."
Clemick-Hirsch Co., 594 National Ave., Milwaukee, Wis.
Columbus Screw and Machine Co., The, 244 Kaiser St., Columbus, Ohio. "Jenkins."
Continental Motor Mfg. Co., 240-244 W. Lake St., Chicago, Ill.
Crouch, Chas. P., & Co., 472-484 Carroll Ave., Chicago, Ill.
Eclipse Mfg. Co., 45 Fort St., Detroit, Mich.
Fast Mach. and Tool Works, 1061-1063 29th Ave., Milwaukee, Wis. "Milwaukee."
Forsyth, W., & Son, Commerce and Charles Sts., West Lynn, Mass.
Fort Wayne Gear and Mach. Co., Fort Wayne, Ind.
Garford Co., The, Elyria, Ohio.
Gearless Transmission Co., Glens Falls, N. Y. "Gearless."
Gleason, The, Works, Rochester, N. Y.
Griswold Mfg. Co., The, Quincy, Mass.
Hatcher, The, Auto-Parts Co., 139 The Viaduct, Cleveland, Ohio.
Hewitt Motor Co., 6-10 E. 31st St., N. Y. City.
Lake View Auto Co., 1049 Sheffield Ave., Chicago, Ill.
Lauth, J., & Co., 528 Elston Ave., Chicago, Ill.
Lebanon Motor Co., Lebanon, Pa.
The Lee Mfg. Co., South Park, Port Huron, Mich. (Made on contract.)
Light Mfg. and Foundry Co., Union and Queen Sts., Pottstown, Pa.
Lipman, Carl E. L., Beloit, Wis.
McClure-Buchner Co., 911 S. Homan Ave., Chicago, Ill. (Friction.)
Mack Bros. Motor Car Co., South Allentown, Pa.
Milwaukee Auto Eng. and Supply Co., 706 Winnebago St., Milwaukee, Wis.
Milwaukee Motor Co., 615 Clybourn St., Milwaukee, Wis.
Mitchell Motor Car Co., Racine, Wis. "Mitchell."
Model Gas Engine Works, 175 Wabash Ave., Auburn, Ind.
Muncie Auto Parts Co., Muncie, Ind.
Murray, W. B., 1253 Milwaukee Ave., Chicago, Ill.
National Mfg. Co., 118 E. 2d St., Dayton, Ohio.
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
N. Y. Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.
Northway Motor and Mfg. Co., Maybury Grand and G. T. R. R., Detroit, Mich.
Phillips Motor Works, 133 La Salle St., Chicago, Ill.
Redington, F. B., & Co., 107 S. Sangamon St., Chicago, Ill.
Rogers, The Geo. D., Automobile Parts Mfg. Co., 5 Kinsman St., Cleveland, Ohio.
Smith, C. O., Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Smith & Mabley, Inc., Broadway, between 56th and [illegible] Sts., New York City.
Sommer Motor Co., Box 138, Detroit, Mich.
Spacke, The F. W., Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.
Speed Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind.
Torbensen Motor Car Co., Bloomfield, N. J.
Trebert Gas Engine Co., 163 Main St., Rochester, N. Y.
Trebert Auto and Marine Motor Co., 407 St. Paul St., Rochester, N. Y.
Trumbull Mfg. Co., Warren, Ohio. (To order.)
Walker, E. C., Co., 1913-23 Logan St., Louisville, Ky.
Warner Gear Co., Muncie, Ind.
Westerfield Motor Co., 1525 Main St., Anderson, Ind.
Western, The, Tool Works, Galesburg, Ill.
Windsor Automobile Co., Evansville, Ind.
York Automobile Co., York, Pa.

Transmission Gear Parts.

American Die and Tool Co., Reading, Pa.

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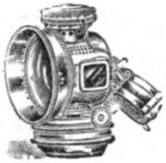

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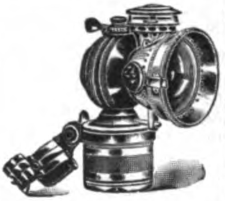

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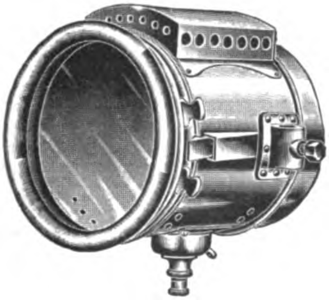

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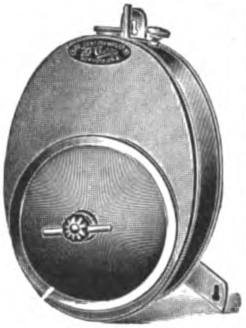

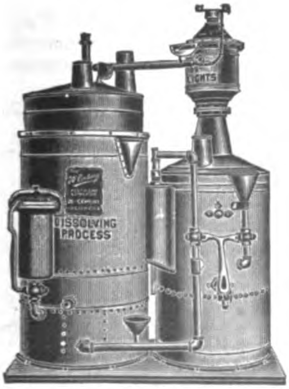

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Trimmings (Automobile).

American Oak Leather Co., Cincinnati, O. "Cathers."
American Top Co., Jackson, Mich.
Atlantic Leather Co., Cor. Wright St. and Ave. A, N. J. (Leather.)
Baltimore Buggy Top Co., The, 700-2 Penna. Ave., Baltimore, Md.
Brouse, W. E., & Co., 47 Vincent St., Cleveland, Ohio.
Buob & Scheu, Court St. and Broadway, Cincinnati, O.
Coleman, Prouty & Root, 234-38 Jefferson Ave., Detroit, Mich.
Detroit Carriage Co., Detroit, Mich.
Dusenbury, Louis, 86-88 North St., N. Y. City.
English & Mersick Co., New Haven, Conn.
Everitt, B. F., 63-65 Fort St., E. Detroit, Mich.
Fabrikord Co., The, Newburgh, N. Y. ("Fabrikoid," imitation leather.)
Halliday, C. A., 42 Cedar St., Oneida, N. Y.
Howell, T. P., & Co., Newark, N. J. (Leather for upholstery.)
Indianapolis Sash Co., The, Indianapolis, Ind.
Kroh, C. Z., & Co., 120 St. Clair St., Toledo, Ohio.
Lackawanna Leather Co., Hackettstown, N. J. (Leather.)
Lane, Thos. W., Chestnut St., Amesbury, Mass.
McCormick, E. H., & Sons, Avenue C and Vanderpool St., Newark, N. J. (Leather.)
Neider, F. A. Co., Augusta, Ky.
Newton, W. H., & Son, Cortland, N. Y.
Pantasote Co., 11 Broadway, N. Y. City. (Imitation leather furnishings and mackintosh goods.)
Parry, A. N., & Co., Amesbury, Mass.
Radel & Mentz Leather Co., Hamburg Place, Newark, N. J. (Leather.)
Reilly, P., & Son, Inc., Mott and Passaic Ave., Newark, N. J. (Leather.)
Rex-Imperial Leather Co., 12-28 Chapel St., Newark, N. J. (Material.)
Ritter Mfg. Co., Detroit, Mich.
Roehm & Davidson, Ltd., Detroit, Mich.
Schubert Bros. Gear Co., Oneida, N. Y.
Snow & Co., N. H., 26 Hawley St., Binghamton, N. Y.
Stengel, George, Inc., Frelinghuysen Ave., Newark, N. J.
Stengel & Rothschild, Main and Kossuth Sts., Newark, N. J. (Leather upholstering.)
Straus & Sons, M., 35 Vesey St., Newark, N. J. (Leather.)
Terwilliger-Stone Leather Co., 210 N. J. R. R. Ave., Newark, N. J. (Leather.)

Trimmings (Boat).

Everitt, B. F., 63-65 Fort St., East Detroit, Mich.

Trouser Guards.

Cole, G. W., Co., 143 Broadway, N. Y. City. "T. & G."
Goodrich, B. F., Akron, Ohio. (Rubber.)
Tingley, Chas. O., & Co., Rahway, N. J.

Trunks, Suit Cases, Etc.

Buxton, B. W., 7 Taylor St., Springfield, Mass. "Buxton." (Trunks.)
Headley & Farmer Co., Newark, N. J. (Trunks, Bags and valises.)
Poughkeepsie Suit Case Co., Poughkeepsie, N. Y. (Suit cases.)

Tubing.

Automobile Supply Mfg. Co., 320 Driggs Ave., Brooklyn, N. Y. (Flexible.)
Briscoe Mfg. Co., 1427-67 Woodward Ave., Detroit, Mich.
Consolidated Mfg. Co., Toledo, O. (Brazed.)
Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich.
The Garford Co., Elyria, Ohio. (Seamless and brazed.)
Kaufman, The A. G., Mfg. Co., 24-26 Murray St., N. Y. City.
Leng's, John S., Sons & Co., 95 Reade St., N. Y. City.
The Long-Turney Mfg. Co., Rome, N. Y. (Spiral.)
The Pittsburg Reduction Co., Pittsburg, Pa. Seamless steel.)
Shelby Steel Tube Co., Frick Building, Pittsburg, Pa.
Standard Welding Co., 35 Cone St., Cleveland, Ohio. Frame and Handle Bar.
Whitlock Coil Pipe Co., Hartford, Conn. (For exhaust and intake pipes.)

Turn Tables.

Autobed Co., 36 Columbus Ave., Boston, Mass.
Auto Supply and Storage Co., 1416 Madison Ave., Baltimore, Md.
Gibbs-Brower Co., 150 Nassau St., N. Y. City.
Link Belt Engineering Co., Hunting Park Ave. and P. & R. Ry., Nicetown, Phila., Pa.
Weber Cycle and Supply Co., 118 N. Tijon St., Colo. Springs, Colo.

Under Water Exhaust.

Submerged Exhaust Co., 149 Water St., Newbury Port, Mass.

Universal Joints.

Baush Machine Tool Co., Springfield, Mass.
Blood Bros. Automobile and Mach. Co., 114 N. Edwards St., Kalamazoo, Mich.
Boston Gear Works, 152 Purchase St., Boston, Mass.
Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.
Hatcher Auto Parts Co., The, 138 The Viaduct, Cleveland, Ohio.
Gray & Prior Mach. Co., The, Hartford, Conn.
Hussey Drop Forge and Mfg. Co., Axtell St., Cleveland, Ohio.
Lehman, I., 61 Middle St., Cleveland, Ohio.
Muncie Auto Parts Co., Muncie, Ind.
Mutual Machine Co., 25 Wells St., Hartford, Conn. "Warren's."
Peninsular Milled Screw Co., 751-55 Bellevue Ave., Detroit, Mich.
Spicer Universal Joint Mfg. Co., Madison Ave. and W. 3d St., Plainfield, N. J.
Steel Ball Co., The, 832 Austen Ave., Chicago, Ill.
Vanderbeek Tool Co., The, Hartford, Conn.
Windsor Automobile Co., Evansville, Ind.

Upholstery Goods.

Fairfield Rubber Co., The, Fairfield, Conn. (Rubber faced lustre mackintosh and dull finish cloth for cushions, aprons, covers, etc.)

Valves (Engine).

Ashton Valve Co., 271 Franklin St., Boston, Mass. (Safety valves and cylinder relief valves.)
Gleason-Peters Air Pump Co., 20 W. Houston St., N. Y. City.
Morgan, B., 86-88 John St., Newport, R. I.
Standard Gauge Mfg. Co., Syracuse, N. Y.
Star Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass. (Pop.)

Valve Parts (Engine).

Boker, Herman Co., 101 Duane St., N. Y. City. (Nickel alloy.)
Forg, Peter, 50 Park St., Somerville, Mass. (Wheels.)
Standard Connecting Rod Co., Beaver Falls, Pa. (Stems.)

Valves (Miscellaneous).

Globe Brass Co., Detroit, Mich.
Hatcher, The Auto Parts Co., 138 Viaduct, Cleveland, O. (Check.)
Spacke, The F. W., Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.

Vaporizers.

American Coil Co., Foxboro, Mass. (Mixing valves.)
Barker, C. L., Norwalk, Conn. "Barker."
Culver Novelty Co., Culver, Ind.
Duryea Power Co., North River and Hockley Sts., Reading, Pa. Atomizer.
Essex, G. B., Brass Co., 480 Franklin St., Detroit, Mich.
Generator Valve Co., 108 Liberty St., N. Y. City. (Marine.)
Murray, John A., 112 Front St., Brooklyn, N. Y.
Tuttle, D. M., Canastota, N. Y.

Varnishes.

Acme White Lead and Color Works, Detroit, Mich. ("New Era.")
Berry Bros., Limited, Detroit, Mich.
Billings-Chapin Co., The, Cleveland, O.
Detroit Lead Works, 532 Milwaukee Ave., Detroit, Mich.
Ditzler Color Co., 18-24 Baltimore Ave., W. Detroit, Mich.
Glidden Varnish Co., Cleveland, Ohio.
Masury & Son, John W., P. O. Box 1012, N. Y. City.
Murphy Varnish Co., Newark, N. J.
Parrott Varnish Co., Bridgeport, Conn. ("Parrott.")
Sherwin-Williams Co., The, 104 Canal St., Cleveland, O.
Smith, Edward, & Co., 45 Broadway, N. Y. City.
Standard Varnish Works, 29 Broadway, N. Y. City.
Valentine & Co., 257 Broadway, N. Y. City.
Wadsworth, Howland & Co., 84 Wash. St., Boston, Mass.

Vehicle Washers.

Ardrey Vehicle Washer Co., Rochester, N. Y. "Ardrey."
Nicholsburg, The H., Mfg. Co., 68 Dey St., N. Y. City. (Overhead.)
Perfect Mfg. Co., 10 Maple Ave., Saratoga Springs, N. Y. ("Perfect.")
Ryan & Long, Appleton, Wis. (Overhead.)
Vehicle Specialty Co., The, Hartford, Conn. (Revolving overhead.)

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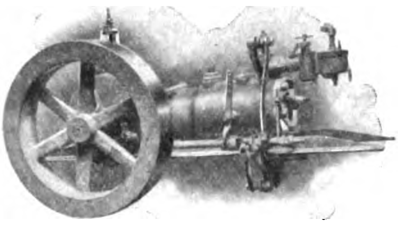

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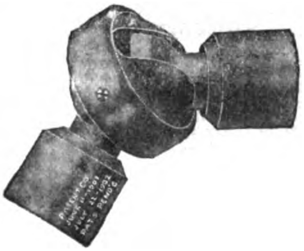

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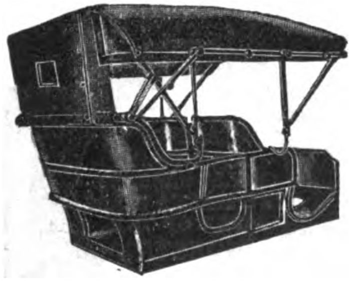

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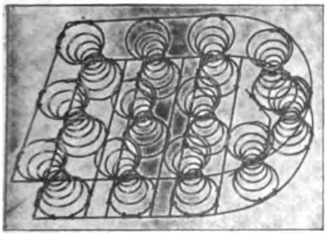

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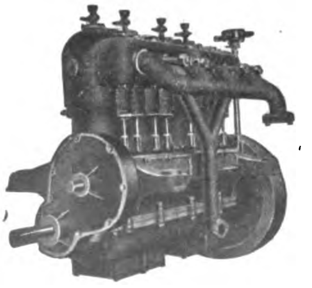

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Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.
Connecticut Telephone and Electric Co., Meriden, Conn. (National Sales Corporation, 256 Broadway, N. Y. City, Factory Sales Mgr.)
Keystone Electrical Instruments Co., 9th St. and Montgomery Ave., Phila., Pa.
Pignolet, L. M., 78 Cortlandt St., New York.
Robert Instrument Co., The, 56 Shelby St., Detroit, Mich.

Voltmeters.

Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.
Eldredge Electric Mfg. Co., 227 Main St., Springfield, Mass.
General Electric Co., Schenectady, N. Y.
Keystone Electrical Instrument Co., 9th St. and Montgomery Ave., Phila., Pa.
Meyrowitz, E. B., 104 E. 23d St., New York City.
Pignolet, L. M., 78 Cortland St., New York.
The Robert Instrument Co., 56 Shelby St., Detroit, Mich.
Rubay, Leon, 140 W. 38th St., New York City. (Manometers.) (Importer.)
Splitdorf, C. F., 23 Vandewater St., New York.
Stanley G. I. Electric Mfg. Co., 29 Broadway, N. Y. City.
Wagner Electric Mfg. Co., 2017 Locust St., St. Louis, Mo.
Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

Vulcanizers.

Auto-Tire Vulcanizing Co., Lowell, Mass.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich, B. F., Co., Akron, Ohio.
Hartford Rubber Works Co., Hartford, Conn.
National Cement and Rubber Mfg. Co., 3053-59 Monroe St., Toledo, Ohio. "High Pressure" and "Red Cross."
Stitch-in-Time Vulcanizer Co., Topeka, Kans. (Portable.)

Washers.

Booth, N. E., & Co., 261 39th St., Brooklyn, N. Y. (Felt.)
Detroit Screw Works, Detroit, Mich.
Peninsular Milled Screw Co., 751-55 Bellevie Ave., Detroit, Mich.
Sittman & Pitt, State St. and Boerum Place, Brooklyn, N. Y.

Wheels (Automobile).

American Pneumatic Wheel Co., The, Lorain, Ohio.
American Roller Bearing Co., S. Framingham, Mass.
Archibald Wheel Co., Lawrence, Mass. (Artillery.)
Auto Supply Co., Inc., 1662 Broadway, N. Y. City.
Borbein, H. F., & Co., 2109 N. 9th St., St. Louis, Mo.
Buckeye Wheel Co., Galion, Ohio.
Bryant Steel Wheel and Rim Co., 429 Hayden Bank Building, Columbus, Ohio. (Steel.)
Carr, A. H., Co., Amesbury, Mass.
Carriage, Wheel and Gear Co., Merrimac, Mass.
City Mach. and Mfg. Co., 9-13 Orchard St., Detroit, Mich.
Couple Gear Freight Wheel Co., The, Grand Rapids, Mich. "Couple Gear."
Eames, A. M., & Co., S. Framingham, Mass.
Imperial Wheel Co., Flint, Mich. "Imperial."
Iron Tire Pneumatic Wheel Co., 259 5th Ave., N. Y. City.
Jamesville Mfg. Co., Jamesville, N. Y.
Jones & Burt, 172 South St., Utica, N. Y.
Lee & Porter Mfg. Co., Buchanan, Mich.
Marohn, C. F., 1111 18th St., Milwaukee, Wis. (Pneumatic hub.)
Midgley Mfg. Co., Dublin Ave., Columbus, O. (Pressed steel.)
Muncie Wheel and Jobbing Co., Muncie, Ind. "Bann-Auto."
Neustadt Auto and Supply Co., 826-30 S. 18th St., St. Louis, Mo.
New Haven Carriage Co., Water and Franklin Sts., New Haven, Conn.
Prudden, W. K., & Co., Lansing, Mich.
Quinby, J. M. & Co., 1534 Broadway, N. Y. City.
St. Mary's Wheel and Spoke Co., St. Mary's, Ohio.
Salisbury Wheel and Mfg. Co., Jamestown, N. Y.
Schwarz Wheel Co., The, 135 N. 12th St., Phila., Pa.
Smith, A. O., Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
Timken Roller Bearing Axle Co., Canton, Ohio.
Turner & Fish, Quincy St., Room 406, Chicago, Ill. "Indestructible.")
Weston-Mott Co., Utica, N. Y.
Zwick & Greenwold Wheel Co., Dayton, Ohio.

Wheels (Cycle).

Jamesville Mfg. Co., Jamesville, N. Y.

Wheel Parts (Automobile).

Hagerstown Spoke and Bending Co., Hagerstown, Md. (Spokes.)
Toomey, C., & Co., 915 Campbell St., Kansas City, Mo. (Reinforcing spokes.)

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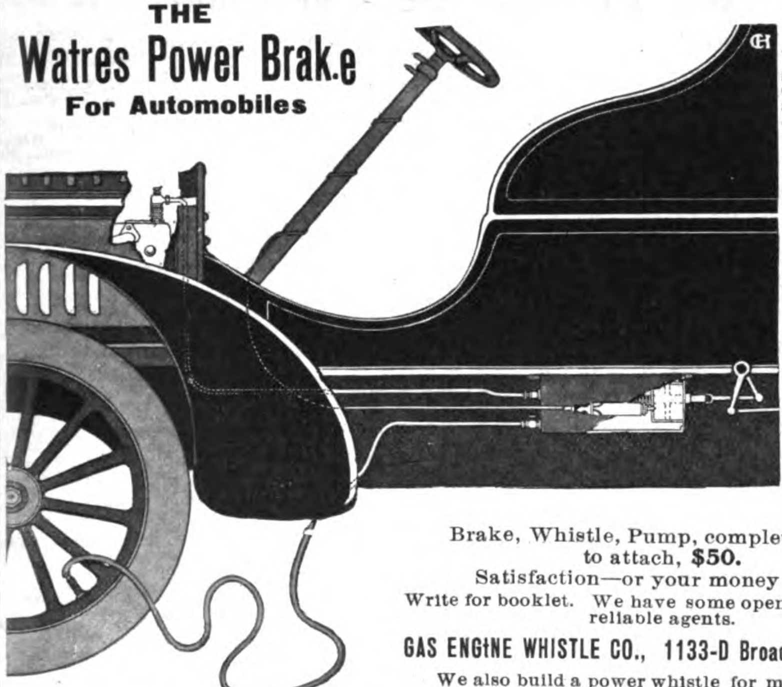

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Whistles (Automobile).

City Machine and Mfg. Co., 9-13 Orchard St., Detroit, Mich.
Gas Engine Whistle Co., 1133 Broadway, N. Y. City.
Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich.

Whistles (Boat).

Durkee, C. D., & Co., 2 South St., N. Y. City, N. Y.
Edmonds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich.
Gas Engine Whistle Co., 1133 Broadway, N. Y. City.
Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich.

Wind Shields.

Automobile Cover and Top Mfg. Co., 148 W. 58th St., N. Y. City.
Detroit Motor Car Supply Co., 1256 Jefferson Ave., Detroit, Mich. (Glass.)
Empire Gear and Top Co., 413 N. 22d St., Phila., Pa.
London Auto Supply Co., 1229-31 Michigan Ave., Chicago, Ill.
Smith, Jos. N., & Co., 4th and Porter Sts., Detroit, Mich.
Teel & Co., E., Medford, Mass. (Celluloid.)

Work of All Kinds Not Otherwise Specified.

Acorn Brass Mfg. Co., 56 S. Peoria St., Chicago, Ill. (Polishing, plating, brass finishing, metal spinning.)
American Ferrofix Brazing Co., The, 813-a Arcade Bldg., Phila., Pa. (Brazing.)
Auto Rebuilding Co., 4105-7 Cottage Grove Ave., Chicago, Ill. (Rebuilding of 1903 and 1904 Cadillacs and Fords.)
Boston Gear Works, 152 Purchase St., Boston, Mass. (Gear cutting.)
Bown Machine Co., Ltd., 92 Jefferson Ave., Battle Creek, Mich. (Contract work.)
Chicago Raw Hide Mfg. Co., 75-77 Ohio St., Chicago, Ill. (Gear cutting.)
Ellis, F. L., & Son, Milldale, Conn. (Contract.) special burning process.)
Floote Bros., Clinton and Wash. Sts., Chicago, Ill. (Gear cutting.)
Garvin Machine Works, Spring and Varick Sts., N. Y. City. (Gear cutting.)
Giddings, C. M., Rockford, Ill. (Designing engines.) gines.)
Gould and Eberhardt, 99 N. J. R. R. Ave., Newark, N. J. (Gear cutting.)
Hatcher Auto Parts Co., The, 133 Viaduct, Cleveland, O. (Contract.)
Helmer, F. F., Lockport, N. Y. (Monograms, designing.)
Hurd & Haggin, 316 Hudson St., N. Y. City. (Repairing.)
Imperial Brass Mfg. Co., The, 245-47 S. Jefferson St., Chicago, Ill. (Contract work and brass finishing.)
Kalamazoo Novelty Co., Kalamazoo, Mich. (Contract work.)
Meisel Press and Mfg. Co., 944-48 Dorchester Ave., Boston, Mass. (Grinding.)
Muncie Auto Parts Co., Muncie, Ind. (Contract.)
Mutual Machine Co., 25 Wells St., Hartford, Conn. (Gear cutting.)
New York Auto Exchange, 154 E. 57th St., N. Y. City. (Gear cutting and brazing.)
Novelty Tufting Machine Co., 182 Mich. Ave., Chicago, Ill. (Upholstering.)
Ohio Auto Improvement Co., St. Mary's, Ohio. (Rebuilding autos.)
Peninsular Milled Screw Co., 751-65 Bellevue Ave., Detroit, Mich. (Case hardening.)
Pope Mfg. Co., Westfield, Mass. (Screw machines work.)
Rubber Goods Repair Co., 89 16th St., Chicago, Ill. (Tire repairing.)
Spacke, The F. W., Machine Co., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind. (Gear and sprocket cutting.)
Springfield Auto Top and Upholstering Co., 102-6 Dwight St., Springfield, Mass. (Upholstering.)
Standard Brazing Co., 88 Broad St., Boston, Mass. (Brazing.)
Standard Supply Co., North Adams, Mass. (Remodeling of Olds carburetors.)
Standard Welding Co., 35 Cone St., Cleveland, Ohio. (Electric welding.)
Van Dorn & Dutton Co., The, 1796 E. Madison St., Cleveland, Ohio. (Gear cutting.)
Wilhelm, The H., Battery Co., 70-72 Frost St., Brooklyn, N. Y. (Repairing broken aluminum castings by

BUYER'S GUIDE—Continued

Wrenches.

The America Co., Momence, Ill.
American Drop Forging and Tool Co., Wayland, N. Y. "American."
Bay State Tool Co., 294 Washington St., Boston, Mass.
Beckley-Ralston Co., 178 Lake St., Chicago, Ill.
Besly, Chas. H., & Co., 15-21 S. Clinton St., Chicago, Ill.
Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. "Billings" cam lever and "B. & S." auto.
Bonner, O. E., Mfg. Co., Chrisman, Ill.
Bullard Automatic Wrench Co., Providence, R. I.
Carpenter, J. M., Tap and Die Co., Pawtucket, R. I. Tap.
Coes Wrench Co., Worcester, Mass.
Edmonds-Metzel Mfg. Co., 153-159 S. Jefferson St., Chicago, Ill. "Universal grips."
Ernest Tool Co., 60 Wall St., N. Y. City.
Essex Mfg. and Supply Co., Newark, N. J. (Locket wrench for plugs.)
Hawkeye Wrench Co., Marshalltown, Iowa.
Hjorth, Wm., & Co., Jamestown, N. Y.
Mossberg, Frank, Co., Attleboro, Mass. "Bi," "Sterling," "Diamond," "Alderman."
Pedersen, J. T., 636-644 First Ave., N. Y. City.
Railway Appliance Co., 1175 Old Colony Building, Chicago, Ill. "Auto-Cle."
Richards Tool Co., 15 Court St., Boston, Mass.
Wakefield, J. E., 89 Exchange St., Worcester, Mass.
Walworth Mfg. Co., 128 Federal St., Boston, Mass. "Stillson."
Wells, F. E., & Son Co., Greenfield, Mass. (Pipe.)
Williams, J. H., & Co., 150 Hamilton Ave., Brooklyn, N. Y.
Worcester Pressed Steel Co., Worcester, Mass.

Yacht Brokers.

Cary, Smith & Ferris, 90 Wall St., N. Y. City, N. Y.
Jones, Frank Bowne, 29 Broadway, N. Y. City, N. Y.
Tams, Lemoine & Crane, 52 Pine St., N. Y. City, N. Y.

INDEX TO BUYER'S GUIDE

Accessories (Motor Cycle) .509
Air Governors for Carburetors 509
Aluminum Castings 509
Ammeters 509
Anchors 509
Anti-Skid Devices 509
Automobiles (Commercial) 509
Automobiles (Electric) .. 510
Automobiles (Gasoline) .. 510
Automobiles (Steam) 512
Automobile Covers 512
Automobile Garages 512
Automobile Parts 512
Auto. Specialties (Misc.) .512
Axles (Automobile) 512
Axles (Cycle) 514
Axle Tubes 514
Balls 514
Ball Bearings (Auto.) 514
Ball Bearings (Cycle) ... 514
Baskets 514
Battery and Coil Cases... 514
Battery Connections 514
Bearings (Automobile) .. 514
Bells (Automobile) 514
Bells (Cycle) 514
Belt Dressing 514
Belts (Motor Cycle) 514
Bent Wood Work 514
Bicycles 514
Bicycles (Chainless) 516
Bicycles (Juvenile) 516
Bicycle Parts (Misc.) 516
Bicycle Sundries (Misc.) .. 516
Bilge Pumps 516
Binding Posts 516
Boat Covers 516
Boat Lighting Outfits ... 516
Bodies 516
Boilers 516
Boiler Shells and Tubes... 516
Bows 516
Bow Sockets 516
Brakes (Automobile) 518
Brakes (Cycle) 518
Brake Bands, etc. 518
Brass and Bronze Castings 518
Brazing Compounds 520
Brazing Forges 520
Buffets, Portable 520
Burners for Steam Autos. 520
Burners for Boat Boilers.. 520
Burner Parts 520
Canopies (Boats) 520
Caps (Auto) 520
Carbide 520
Carburetors 520
Carburetor Floats 520
Carrier Cycles 522
Castings 522
Cements 522
Chains (Cycle) 522
Chain Adjusters 522
Chain Cleaning Materials. 524
Chain Guards (Automobile) 524
Chain Guards (Cycle) 524
Chain Guard Attachments (Cycle) 524
Charging Apparatus 524
Chassis, Complete 524
Chucks (see Machinery) .. 548
Cigar Lighter 524
Circuit Breakers 524
Cleansing Compounds ... 524
Child's Seat (Cycle) 524
Clips and Clamps 524
Clock Holders 524
Clocks (Automobile) 524
Clothing (Auto) 524
Clothing (Yacht) 524
Clutches 526
Clutch Leather 526
Cocks 526
Coaster Brakes 526
Collapsible Bucket 526
Commutators 526
Condensers (Steam) 526
Condenser Parts 526
Controllers (Electric) 526
Cranes 526
Cranks (Cycle) 526
Crank Hangers 526
Crank Hanger Parts 526
Crank Shafts 526
Curtain Fasteners 526
Curtains (Boat) 526
Cushions 526
Cycle Engines 526
Cycle Engine Parts 526
Cycle Stands 526
Cyclometers 526
Cylinder Oil 528
Dashes 528
Dies and Taps (See Tools) 566
Differential Gears 528
Distributors 528
Distributors (Wholesale).
Dress Guards (Cycle) 528
Drills (See Machinery) .. 548
Dust Rings and Washers. 528
Dust Shields (Auto) 528
Dynamos 528
Electric Auto Motors 528
Emergency Cases 528
Enamels (Air Drying) ... 528
Enamels (Baking) 528
Enameling Ovens 528
Engine Packings 528
Engine Parts (Auto.) 528
Engine Starters 530
Expanders 530
Felt Washers 530
Fenders 530
Fender Hangers 530
Fire Extinguishers 530
Flags and Pennants 530
Flexible Shafts for Speed Indicators 530
Forgings 530
Forks (Cycle) 530
Forks (Motor Cycle) 530
Fork Crowns 530
Fork Sides 530
Forming Machines (See Machinery) 548
Frames (Automobile) 530
Frames (Boat) 530
Frames (Cycle) 530
Frames (Motor Cycle) 530
Frame Fittings (Cycle) .. 530
Fuel Level Indicators.... 532
Fuel Regulators 532
Fuel Strainers and Separators 532
Funnels 532
Garages 532
Gasoline Auto Engines .. 532
Gasoline Cans 536
Gasoline Engine Fittings. 536
Gasoline Storage Outfits.. 536
Gasoline Tank Gauges.... 536
Gauges 536
Gauge Light 536
Gauntlets 536
Gear Blanks 536
Gear Cases (Automobile). 536
Gear Cutters (See Machinery) 548
Gears and Pinions 536
Generators (Acetylene) .. 536
Goggles and Masks 536
Grademeters 536
Graphite 536
Greases 536
Grease Cups 536
Grinders (See Machinery) 548
Grips (Auto) 538
Grips (Cycle) 538
Hampers 538
Handle Bars 538
Hardware (Auto) 538
Hardware (Marine) 538
Heaters 538
Hoods 538
Hood Blinds 538
Hose Connectors and Menders 538
Horns (Automobile) 538
Horns (Boat) 538
Horns (Cycle) 538
Horns (Motor Cycle) 538
Horn Blowers 538
Horn Parts 538
Houses (Automobile) 538
Hubs (Automobile) 538
Hubs (Cycle) 538
Hub Machines (See Machinery) 550
Hub Parts (Automobile). 538
Hulls 538
Hull Coating 538
Hydrometer 538
Ignition Apparatus (Miscellaneous) 538
Ignition Apparatus Fittings 538
Ignition Batteries 542
Importers (Auto Goods).. 542
Importers (Cycle Goods).. 542
Inner Tubes (Auto) 542
Inner Tubes (Cycle) 542
Inner Tube Bags 542
Instruction (Auto, Motor Cycle and Boat) 542
Insulation 542
Insurance (Auto) 542
Iron Castings .... [illegible]
Jacks 544
Jobbers (Automobile Parts and Supplies) 544
Jobbers (Boat Materials). 544
Jobbers (Cycle Parts and Fittings) 544
Jobbers (Cycle Sundries). 544
Jobbers (Cycle and Sundries) 544
Jobbers (Motor Cycle Parts and Accessories).. 544
Jobbers (Tools and Machinery) 544
Juvenile Foot and Hand Propelled Vehicles) 544
Lacing Cord 544
Lamps (Automobile) 546
Lamps (Boat) 546
Lamps (Cycle) 546
Lamp Brackets (Automobile) 546
Lamp Brackets (Boat)... 546
Lamp Brackets (Cycle)... 546
Lamp Covers 546
Lamp Parts and Accessories (Auto) .... [illegible]
Lamp Parts (Cycle) 546
Lathes (See Machinery).. 550
Lavatories 546
Levers 546
License Tags 546
Locks (Cycle) 546
Lubricant Injectors 548
Lubricators 548
Luggage Carriers 548
Machinery .... [illegible]
Machinery Parts .... [illegible]
Machine Work .... [illegible]
Magnetic Plugs .... [illegible]
Magnetos .... [illegible]
Manufacturers' Agents .. [illegible]
Marine Engines .... [illegible]
Marine Glue .... [illegible]
Marine Specialties (Miscellaneous) .... [illegible]
Mats .... [illegible]
Metal Figures .... [illegible]
Meters (Miscellaneous) .. [illegible]
Milling Machines .... [illegible]
Miscellaneous Articles Not Otherwise Specified .... [illegible]
Motor Boats (Gasoline).. [illegible]
Motor Boats (Electric)... [illegible]
Motor Boats (Steam) ... [illegible]
Motor Cycles .... [illegible]
Motor Cycle Parts .... [illegible]
Mountings (Automobile). [illegible]
Mountings (Boat) .... [illegible]
Mud Guards (Cycle).... [illegible]
Mud Guards Attachm'ts.. [illegible]
Mufflers .... [illegible]
Name Plates .... [illegible]
Naval Architects .... [illegible]
Non-Freezing Compounds. [illegible]
Nuts and Bolts .... [illegible]
Odometers .... [illegible]
Oils .... [illegible]
Oil Cans (Automobile)... [illegible]
Oil Cans (Cycle) .... [illegible]
Oil Cups (Automobile) .. [illegible]
Oil Cups (Cycle) .... [illegible]
Oil Hole Covers .... [illegible]
Oil Storage Outfits .... [illegible]
Owners' and Dealers' Lists .... [illegible]
Paints .... [illegible]
Panels (Body) .... [illegible]
Patterns (Auto) .... [illegible]
Patterns (Boat) .... [illegible]
Pedals (Auto) .... [illegible]
Pedals (Cycle) .... [illegible]
Pipe Fittings .... [illegible]
Planers (See Machinery). [illegible]
Platers .... [illegible]
Pliers .... [illegible]
Polishes (Metal) .... [illegible]
Polishes (Wood) .... [illegible]
Polishing Machines (See Machinery) .... [illegible]
Portable Electric Lights. [illegible]
Presses (See Machinery). [illegible]
Propellers .... [illegible]
Propeller Shafts .... [illegible]
Publications .... [illegible]
Pumps (Air for Steam Autos) .... [illegible]
Pumps (Circulation) .... [illegible]
Pumps Cycle Tire) .... [illegible]
Pumps (Fuel) .... [illegible]
Pumps (Oil) .... [illegible]
Pumps (Automobile Tire) [illegible]
Pumps (Water for Steam Autos) .... [illegible]
Pump Connections (Auto) .... [illegible]
Pump Connections (Cycle) [illegible]
Pump Parts (Cycle Tire) [illegible]
Pumps (Power and Storage) .... [illegible]
Radiators .... [illegible]
Radiator Parts .... [illegible]
Rain Aprons .... [illegible]
Raw Material .... [illegible]
Repairs, Sales and Storage .... [illegible]
Reversing Gear (Boat) .. [illegible]
Rims (Automobile) .... [illegible]

INDEX TO BUYER'S GUIDE—Continued

Rims (Cycle) 568
Rim Making Machinery (See Machinery) 560
Robes 568
Roller Bearings (Automobile) 566
Rubber Tubing 568
Rubber Fittings (Automobile) 568
Rubber Fittings (Cycle) 568
Running Gears 568
Running Gear Parts 570
Rust Preventatives 570
Saddles 570
Saddle Clamps 570
Screw Drivers 570
Schools 570
Screw Machines (See Machinery) 550
Screw Machine Parts 570
Seats (Automobile) 570
Seats (Boat) 570
Seat Posts 570
Second Hand Automobiles 570
Shapers (See Machinery) 550
Sheet Metal Articles 570
Shock Absorbers and Auxiliary Springs 570
Slat Irons 570
Spanners 570
Spark Coils 570
Spark Intensifiers 572
Spark Plugs 572
Spars 574
Speed Indicators 574
Splash Aprons 576
Spokes (Cycle) 576
Spoke Making Machinery (See under Machinery) 550
Spoke Nipples (Cycle) 576
Spoke and Nipple Grips (Cycle) 576
Spoke Nipple Washers (Cycle) 576
Springs (Body) 576
Springs (Cycle) 576
Springs (Small) 576
Spring Clips 576
Sprockets (Automobile) 576
Sprockets (Cycle) 576
Stampings 576
Stationary Engines (Gas) 576
Stationary Engines (Gasoline) 576
Stationary Engines (Kerosene) 578
Stationary Engines (Petroleum) 578
Steam Auto Engines 578
Steam Engine Fittings 578
Steam Vehicle Fittings 578
Steel Castings 578
Steel Wire Belts 578
Steering Apparatus (Automobile) 578
Steering Apparatus (Boat) 578
Steering Knuckles 578
Steering Levers 578
Steering Rods 578
Steering Wheels (Auto) 578
Steering Wheels (Boat) 578
Steering Wheel Rims 578
Steering Yokes 579
Steps (Automobile) 579
Step Shanks 579
Storage Batteries 579
Storage Battery Supplies 579
Store Lights 579
Storm Fronts 579
Switches 580
Tandem Attachments 580
Tanks (Auto) 580
Tanks (Boat) 582
Telegraph System for Boats 580
Terminals 582
Timers 582
Time Recording Padlocks 582
Tires (Automobile) 582
Tire Brackets 582
Tires (Cycle) 582
Tire Cases 582
Tire Inflaters (Mechanical) 582
Tire Pressure Registers 584
Tire Protectors 584
Tire Protector Rivets 584
Tire Repair Articles (Automobile) 584
Tire Repair Articles (Cycle) 584
Tire Repair Kits (Automobile) 584
Tire Repair Kits (Cycle) 584
Tire Repair Liquids 584
Tire Repair Tape 586
Tire Repair Tools (Automobile) 586
Tire Repair Tools (Cycle) 586
Tire Valves (Automobile) 586
Tire Valves (Cycle) 586
Tire Valve Stems (Cycle and Auto) 586
Toe Clips 586
Tools 586
Tool Bags (Cycle) 586
Tool Bags and Rolls (Automobile) 588
Tops (Automobile) 588
Top Fabrics 588
Top Parts (Automobile) 588
Transmission Devices 588
Transmission Gear Parts 588
Trimmings (Automobile) 590
Trimmings (Boat) 590
Trouser Guards 590
Trunks, Suit Cases, etc. 590
Tubing 590
Turn Tables 590
Under Water Exhaust 590
Universal Joints 590
Upholstery Goods 590
Valves (Engine) 590
Valve Parts 590
Valves (Miscellaneous) 590
Vaporizers 590
Voltmeters 592
Varnishes 590
Vehicle Washers 590
Vises (See under Tools) 586
Volt-Ammeters 592
Vulcanizers 592
Washers 592
Wheels (Automobile) 592
Wheels (Cycle) 592
Wheel Making Machinery (See under Machinery) 550
Wheel Parts (Automobile) 592
Wheel Truers (See under Tools) 586
Whistles (Automobile) 593
Whistles (Boat) 593
Wind Shields 593
Work of all Kinds Not Otherwise Specified 593
Wrenches 593
Yacht Brokers 593

INDEX TO READING MATTER

Automobiles (Commercial).
Halsey Steam Truck—Jas. T. Halsey Motor Truck Co. .. 180
Iroquois Motor Stages, by W. J. Grube 229
Cleveland Concern Features Commercial Car 136
"Sheffield" Inspection Cars—Fairbanks Morse Co. 212
Automobiles (Electric).
Baker 1906 Electric Cars: By W. J. Grube 148
Automobiles (Gasoline).
Aerocar Co., The .... 104 & 200
American Locomotive Motor Car 97
1906 Auburn—Auburn Automobile Co. 96
1906 Berkshire Cars—Berkshire Automobile Co. 236a
Blomstrom Co.'s 1906 Queen Cars 98
Cleveland 1906 Motor Car. By W. J. Grube 144
Crawford 1906 Five-Passenger Touring Car 229
"Dorris" Car, The—Dorris Motor Car Co. 206
Duquesne 1906 Air-Cooled Touring Car. W. J. Grube .. 214
Gaeth 1906 Cars, The, by W. J. Grube 174
Gale 1906 Automobiles—Western Tool Works 247
Lambert 1906 Line of Automobiles, The 225
Maxwell Briscoe Co.'s Wonderful Record 246
Moline 1906 Cars—Moline Automobile Co. .... [illegible]
Moon 1906 Model A—Moon Motor Car Co. 97
National 1906 Gasoline Cars, The 230a
New Cars of the Hewitt Motor Co. .... [illegible]
New Reo Coupe—The Reo Motor Car Co. 172
Pope Toledo Type XII—Pope Motor Car Co. 138
Premier 1906 Air-Cooled Touring Cars, Hugh Dolnar .. 185
Three Jackson 1906 Cars—Jackson Automobile Co. 233
Thomas Flyer, The 1906, by W. J. Grube 109
Torbensen Motor Car Co.'s Product for 1906 166
Walker Runabout—Walker Motor Car Co. 108
Welch 1906 Motor Cars, The, by Hugh Dolnar 152
Automobiles (Steam).
Lane 1906 Steam Car—Lane Motor Vehicle Co. 231a
Carburetors.
"Breeze" 1906 Carburetor, The—Breeze Motor Mfg. Co. 274
Fouch Automatic Carburetor 310
Garllus Carburetor, The 1906—The Winkley Mfg. Co. ... 318
Kellogg Carburetor, The 1906 332
Schmidt Carburetor, Minn. Boat & Power Works 276
Walker Adjustable Throttling Ratio Carburetor 294
Engines.
"Continental" 1906 Engines, Cont. Motor Mfg. Co. 266
Holtz Gasoline Engine—Illinois Automobile & Parts Co. 278
Funnels.
Duplex Folding Funnels and Basins 316
Index Funnel, The, W. T. Taliaferro Mfg. Co. 378
General.
American Cars for American Buyers 76
Automobile Credit Association 78
Coming Events 69
Editorials 73
Florida Races 83
Local Shows 84
Two New York Shows 79
Generators.
"Neverout" Patent Invertible Gas Producer 258a
"Sunlyte" Generator, The—New Sporting Goods Co. 344
Heaters.
"Peerless Automobile Heaters—Willis F. Seaman .. 378
"Manhattan" Automobile Heater 250
Horns.
A. S. M. Co.'s Horns—Automobile Supply Mfg. Co. ... 376
Gabriel 8-Chime Horn—Gabriel Horn Mfg. Co. .... [illegible]
Miller Combination Siren Horn—Chas. E. Miller .... [illegible]
Hose Connectors.
Morgan's Hose Coupling—B. Morgan 370
"Pittsburg" Hose Connector 368
Ignition Apparatus.
"Buldog" Battery Connection—The B. & B. Co. .... [illegible]
Connecticut Spark Coil—Connecticut Tel. & Elec. Co. .. 249
De Luxe 1906 Ignition Plug—De Luxe Mfg. Co. 252a
Holley Magneto Ignition System 256a
"Rich Spark" Plug—Richardson Engineering Co. .... [illegible]
Lamps (Automobile).
A. S. M. Co.'s Lamps—Automobile Supply Mfg. Co. 376
Atwood Headlight, The—Atwood Mfg. Co. 374
E. & J. 1906 Lamps—Edmunds & Jones Mfg. Co. 328
Ham Cold Blast "Tourist" Lamp—C. T. Ham Mfg. Co. 330
Lubricants.
"Autoline" Oils—Wm. C. Robinson Oil Co. 368
Baums Lubricants—Baums Castorine Co. 330
O. T. O. Oils and Greases—Allerton Oil and Grease Co. 328
Marine Motors.
Du Brie 1906 Marine Engines—Du Brie Motor Co. 394
Holmes Marine Motors—Holmes Auto Boat Co. 397
Knox 1906 4-Cycle Marine Motor, Camden Anchor-Rockland Marine Motor Co. 392
"Pequeot" Marine Motors—New London Motor Co. ... 400
Motor Boats.
"Auto-Junior" $125 Launch, Edson Motor Boat Co. 386
Holmes Motor Boats—Holmes Auto Boat Co. 397
How to Build the Brooks Light Racing Launch 402
Mullins Steel Launches—W. H. Mullins Co. 393
Superior $200 18-ft. Launch—Lake Shore Eng. Works .. 396
Motor Cycles.
Harley-Davidson Motor Cycle, The 1906 378
Erie Motor Cycle, 1906—The Motor Cy. Eq. & Sup. Co. 308
Thoroughbred Motor Cycle—Reading Stan. Cy. Mfg. Co. 304
Mufflers.
Davis Muffler and Power Developer—Chas. P. Fonds. 278
"Powell" Muffler—Powell Mfg. Co. 372
Transmission.
"Continental" 1906 Transmission—Cont. Motor Mfg. Co. 266
"Reeves" Variable Speed Transmission 354
Shock Absorbers.
Diezeman Shock Absorber Co. 251
Foster Shock Absorber—Gabriel Horn Mfg. Co. 251a
1906 Hartford Suspension—E. V. Hartford 251
"House" Recoil Check—Baldwin Ch. & Mfg. Co. 346
"Perfection" Air Cushion, The—Sheddan Mfg. Co. ... 362
Speedometers.
Jones Speedometer-Odometer 1906 Model—Jos. W. Jones. 332
Rollins Speed and Mile Register—Rollins Mfg. Co. 250a
"Springfield" Speedometer, R. H. Smith Co. 374
Switches.
Lock Switch Co.'s Switch—Lock Switch Mfg. Co. 250a
Payne Dry Battery Storage Switch—J. W. Payne 348
Steering Devices.
Gemmer Steering Device—The Gemmer Engine Co. 388
Warner Steering Gear—Warner Gear Co. 267a

INDEX TO READING MATTER

(Continued.)

Timers.

"Ideal Timer, The 1906—C. T. Altemus & Co. 290
"Powell" New Double Contact Timer—Powell Mfg. Co. 372

Tires.

Ajax Automobile Tires 84
Goodyear 1906 Tire Features 312
Hartford & Dunlop Tires, 1906 312
Mesinger Pneumatic Leather Tire 380
Miller Solid Rubber Bicycle Tire—Chas. E. Miller.... 272
Mitchell Punctureless Pneumatic Tire........................ 316
Pennsylvania Flat Tread Tires 250a
Steel Studded Tires—Continental Caoutch Co.......... 336

Tops.

Automobile Top and Cover Co. 336
C. P. & R. Auto Tops—Coleman, Prouty & Root...... 352

Miscellaneous Automobile Parts and Accessories.

American Castings—Manufacturers Foundry Co......... 115
"Auto-Buffet", The—Wotherspoon Portable Buffet Co. 334
B. & J. 1906 Accessories—B. & J. Mfg. Co. 370
"Breeze" Fuel Strainer, The 1906 310
Briscoe New Fan and Deck Box—The Briscoe Mfg. Co..259a
Brown Ratchet Chain Tool, The—J. C. Brown 316
Brown Yielding Sprocket, The—The Armac Motor Co...257a
Buck Tire Valve—L. K. Buck Tire Valve Co...........251a
Buxton Hampers and Trunks—B. W. Buxton.......... 314
C. P. & R. Trimmings—Coleman, Prouty & Root.... 352
"'Continental" 1906 Clutch—Continental Motor Mfg. Co. 266
Cook Standard Tool Grinder—Cook's Ry. Appliance Co. 358
Corson Motor Cycle Spec. Indian Motor Cy. Co.....252a
Deere-Clark Motor Car Co........................ 200
Defiance Felloe Boring and Compressing Machine.... 358
"Demo" Tire Pump—Bridgeport Brass Co.............. 334
Eureka Separator, The 1906—The Winkley Mfg. Co..... 318
Ever-Ready Starter—Am. Elec. Nov. & Mfg. Co.....254a
Frankels Testing Clip—Frankels Testing Clip Co....... 280
1906 Apple Storage Battery Charger—Dayton Elec. Co. 354
"Gearless" Boat Reversing Device 393
"Geecee" Charging Outfit—Royal Battery Co...........251a
Halfpenny Auxiliary Spring—Martin Halfpenny 268
Hendee Mfg. Co.'s New Factory, The 272
Jones Speedometer-Odometer 1906 Model 332
Klesey Self-Adjusting Spring Suspension 268
Kimball Steel Tire Case, The—C. E. Kimball 344
"Kinwood" Oilers, Radiators, Etc.—Kinsey Mfg. Co... 270
Line of "Standard" Bearings, The 1906................ 283
"Lobee" Bilge Pump—Lobee Pump & Mach. Co. 395
Lock Switch Co.'s Tire Gauge—Lock Switch Mfg. Co...260a
Mercer Roller Bearing Spring—Fred. J. Mercer......... 382
Mercury Arc Rectifier—General Electric Co. 376
Millers' New Specialties—C. E. Miller 326
Neustadt 1906 Commercial Vehicle Outfits 296
New Meyrowitz Goggles—E. B. Meyrowitz 314
Newport Plug Protector—Newport Engineering Works.. 298
Newport Plug Protector and Pump Connection 298
Ofeldt Boilers—Aug. Ofeldt Co 324
"Perfect" Automobile Washers 356
Perfection Cushions—Trenton Spr. Matt. Co. 256a
Post & Lester Co.'s 1906 Specialties—Post & Lester Co. 338
"S. & M." Simplex Hull No. 95—Smith & Mabley Co.. 387
"Simplex" Spring Saddle Support, The—C. W. Errick. 344
Spaulding Reversible Propeller 396
Submerged Exhaust—Submerged Exhaust Co. 408
Tire Tools—Teel & Co. 350
Toomey Reinforcing Spoke Attachment 356
Tritone Whistle, The—New York Sporting Goods Co... 346
"Union" Automobile Bows—Union Auto Bow Co. 336
"Western" Fuel Storage Outfit 254a
Westinghouse Charging Receptacle 382
Wind Shield, The—E. Teel & Co........................ 360

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No. 1905 Autocar runabout; in perfect condition; looks like new; price $600.00.

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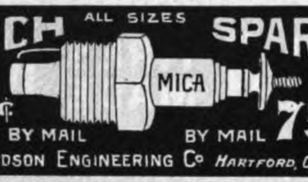

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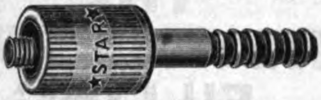

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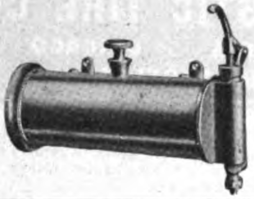

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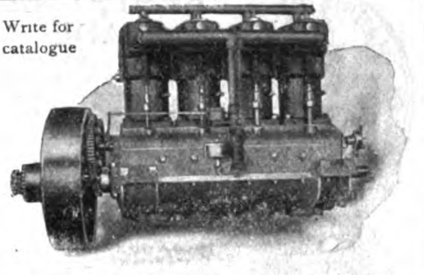

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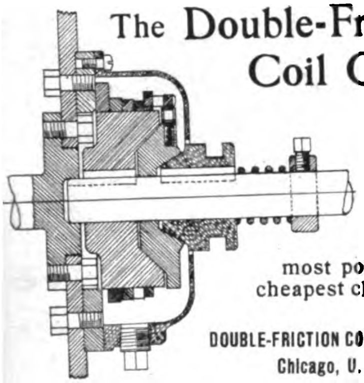

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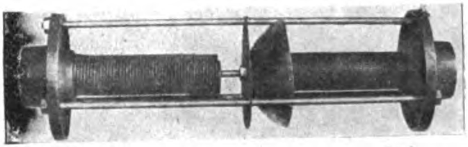

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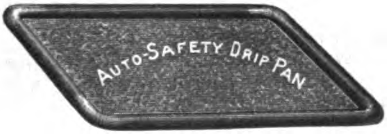

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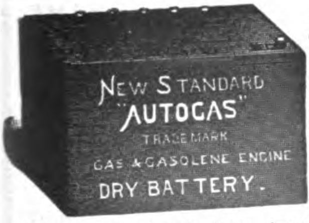

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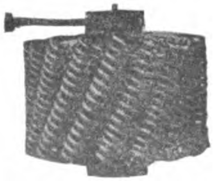

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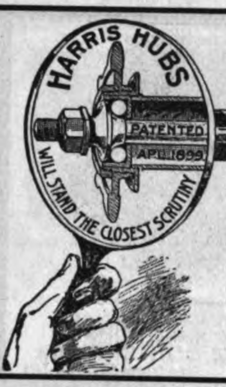
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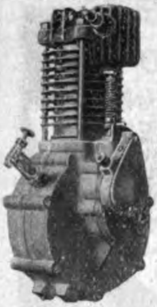

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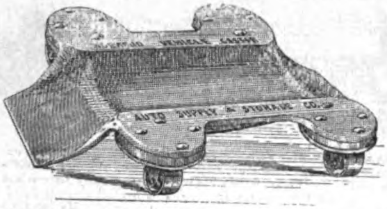

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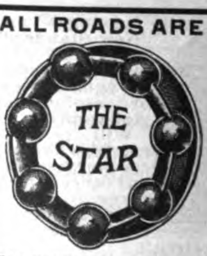

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ADVERTISER'S INDEX

. & J. Mfg. Co....................60
-Z Co. 45
cetylene Gas Ill. Co..............495
cme Motor Car Co..................48
cme Steel & Mal. Iron Works..504
corn Brass Mfg. Co...............459
dwear Auto. Tire Sleeve Co.....584
erocar Co. 511
Albright Mfg. Co..................497
Allyne Brass Foundry Co.........293
Altemus, C. L. & Co...............52
American Ball Bearing Co........463
American Battery Co.............447
American Coil Co..................425
American Die & Tool Wks........439
American Lamp Co.................464
American Elec. Nov. Co.....51 & 510
American Generator Co...........521
American Locomotive Auto. Co...606
American Lubricator Co..........356
American Motor Co.........557 & 600
American Veneer Co...............478
riel Motor Car Co.................607
rmac Motor Co.....................175
rmstrong & Co.....................480
shton Valve Co....................501
sso. of Licensed Auto. Mfrs....513
ster Co., The.............608 & 609
tlas Machine Co...................493
twater-Kent Co....................179
twood Mfg. Co.....................369
uburn Automobile Co.....125 to 128
udel, Theo. & Co.........435 & 441
urora Automatic Mach. Co......600
ustin Auto Co.....................45a
uto Accessories Co...............486
uto. Body Co......................506
uto. Brass & Aluminum Co.....485
utocar Co. ....18 & 19
uto. Club of America Show....177
uto. Lock Plug Co.................471
uto. Maintenance Co..............487
utomobile Equipment Co.........257
utomobile Supply Co.............337
utomobile Supply Mfg. Co.......433
Auto Owner 562
uto. Pump Co.....................566
uto. Rebuilding Co...............505
uto. Supply Co. 232
uto. Supply & Storage Co........602
uto. Tire Vulcanizing Co.........507
. & J. Mfg. Co.......497, 498 & 602
adger Brass Mfg. Co.......221 to 224
adger, E. B. & Sons...............482
ailey, C. J. & Co..................213
aker Motor Vehicle Co............137
aker-Vawter Co. 500
aldwin Chain Mfg. Co.............523
all-Fintze Co. 475
arndt-Johnson Auto. Sup. Co...600
arnes, Wallace Co.................439
arnes, W. F. & J. Son Co.........357
artholomew Co. ....161 to 164
ay State Stamping Co.............508
eaver Mfg. Co.....................414
eckley-Ralston Co. ......319 to 322
eilfus Motor Co....................467
erkshire Automobile Co....37 & 37a
esly, Chas. H. & Co...............539
iddle & Smart Co..................418
Biehl's Carriage & Wagon Wks...505
Blanchard, A. W....................502
Bliss-Chester Co. 468
Bliss, E. W. & Co...................504
Blomstrom, C. H. Motor Co..58 & 59
Blood Bros. Auto. Co...............474
Booth, N. E.........................504
Borbein, H. F. & Co................479
Boston Auto. Ex.....................600
Boston Auto. Gage Co..............435
Boston Gear Works.................446
Bowser, S. F. & Co..................478
Boyer-Radford & G'n T. & P. Co.434
Bradford Motor Works.............487
Breese & Lawrance 460
Breeze Motor Mfg. Co..............428
Brennan Motor Co...................531
Bridgeport Brass Co.................313
Bridgeport Deoxidized Bronze & Metal Co. 473
Briscoe Mfg. Co.....................567
Brown-Lipe Gear Co................331
Brown, S. N. & Co..................463
Brown, J. C. Mfg. Co...............489
Bryant Steel Wheel & Rim Co...508
Buckeye Jack Mfg. Co.............373
Buckeye Mfg. Co............34 & 34a
Buffalo Specialty Co...............555
Buick Motor Co.....................506
Bullard, J. H........................430
Bullard Automatic Wrench Co...311
Buob & Scheu.......................503
Byrne, Kingston Co.............5 to 10
Cadillac Auto. Co.................. 60
Camden Anchor-Rockland Mch. Co. 405
Canedy, Earl 517
Carbondale Chemical Co...........508
Carlson, Chas. A....................407
Carpenter Steel Co.................460
Cassard, Hamilton 500
Central Mfg. Co.....................603
Century Auto. Power Co...........591
Century Cement Machine Co......462
Chadwick Motor Car Co..........252b
Champion, Albert C................468
Champion Mfg. Co..................601
Chester, Henry C. Co...............532
Chicago Auto. Show................199
Chicago Eye Shield Co.............508
Chicago Rawhide Mfg. Co.........502
Clark, A. N. & Son..................491
Cleveland Motor Car Co...........135
Coates Clipper Mfg. Co............475
Coes Wrench Co.....................273
Columbia Electric Co...............449
Columbia Lubricant Co............561
Columbus Buggy Co................482
Columbus Screw & Machine Co....467
Commercial Motor Car Co.........169
Connecticut Tel. & Elec. Co.......211
Consolidated Mfg. Co...445, 492 & 515
Continental Caoutchouc Co........422
Continental Engine Co.............508
Continental Motor Mfg. Co........415
Cook's Ry. Appliance Co...........371
Cook's, Adam Sons..................485
Coops, Chas. W......................493
Corbin Motor Vehicle Co...........187
Corbin Screw Corporation..........353
Correspondence School of Auto. Engineering 476
Cortland Forging Co................489
Corwin Mfg. Co.....................151
Covert Motor Vehicle Co..........479
Crane & Richardson................501
Crawford Automobile Co.......... 60
Crescent Forging Co................437
Cronin, J. W.........................428
Crouch Motor Co....................491
Crouse-Hinds Co. 496
Cullman Wheel Co..................474
Culver Novelty Co.................487
Curtiss, G. H. Mfg. Co.............461
Cycle Skate & Sporting Gds. Co.602
Dac Auto. Supply House...........543
Daimler Mfg. Co....................448
Dann Bros. & Co....................505
Davis Mfg. Co.......................452
Dayton Folding Tonneau Co......479
Dayton Electrical Mfg. Co........583
Dayton Motor Car Co..............413
Deere-Clark Motor Car Co........139
Defiance Machine Wks........... 31
De Luxe Mfg. Co....................481
Deutzeau, Geo. 502
Detroit Auto. Mfg. Co..............506
Detroit Auto. Specialty Co........500
Detroit Auto. Vehicle Co..........413
Detroit Steel Products Co.........256
Diamond Chain & Mfg. Co........442
Diamond Rubber Co., Inside Front Cover
Diamond Stamped Ware Co.....504
Dieter Steam Engine Co...........501
Dietz, R. E. Co.......339, 340 & 341
Diezeman Shock Absorber Co.....577
Dixon, Joseph Crucible Co........506
Dodge Lubricator Co...............549
Dorris Motor Car Co............... 47
Double Friction Coil Clutch Co..601
Dover Stamping & Mfg. Co.......601
Dow Portable El. Co.........22 & 23
Duane, W. J.........................326
Du Brie Motor Works..............403
Duff Mfg. Co........................376
Dunbar Bros. 496
Dunham, D. B. & Son..............503
Duplex Ignition Co.................592
Dunn, Walter E.....................401
Duquesne Construction Co........ 39
Duryea Power Co.................. 35
Dyke, A. L., Auto. Supply Co...327
Eastern Carbon Co..................469
East Liberty Auto. Co..............506
Eclipse Auto. Co....................506
Eclipse Buggy Co...................505
Eclipse Machine Co................377
Edmunds & Jones Mfg. Co........455
Edson Boat Co......................401
Elbridge Electrical Mfg. Co.......507
Eldredge Electric Mfg. Co.........507
Electric Storage Battery Co.......465
Electric Vehicle Co............... 30
Elliott, W. J. & Co.................502
Ellis, F. L. & Son...................504
Elmore Mfg. Co......................122
Elwell-Parker Electric Co..........465
Empire Rubber Mfg. Co............472
Empire State Dry Battery Co...596
Ericka Mfg. Co......................499
Essex, G. R., Brass Co.............435
Essex Mfg. & Supply Co...........453

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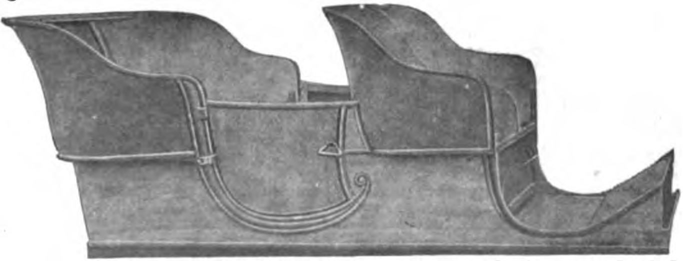

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ADVERTISER'S INDEX—Continued

Eureka Mower Co. 499
Everitt, B. F. 483
Excelsior Spark Plug Co. 477
Excelsior Supply Co. .... 359 to 366
Fahnestock Transmitter Co. 507
Fairmount Engineering Works 466
Fedders Mfg. Co. 500
Felix Mfg. Co. 504
Firestone Tire & Rubber Co. 52 & 52a
Fischer Special Mfg. Co. 498
Fisk Rubber Co. 451
Foote, D. E., Rubber Co. 502
Ford Motor Co. .... 105 to 108
Forg, Peter 501
Fouch, J. B. 482
Fowler-Manson-Sherman Cycle Co. 600
Franklin, H. H., Mfg. Co. 141
Frost, F. E. 499
Fulmer, E. F. 507
Funke, A. H. 283
G. & J. Tire Co. .... 419, 423 & 429
Gabriel Horn Mfg. Co. 457
Garage Equipment Co. 508
Garford Co. 193
Gary, Theo. & Co. 470
Gas Engine Whistle Co. 503
Gearless Transmission Co. 207
Geer, Harry R. Co. 491
Gemmer Engine Co. 533
General Electric Co. 230
Gerson-Carey Co. 507
Gibney, James L. & Bro. 271
Giddings, C. M. 509
Gilbert Mfg. Co. 265
Gill, P. H. & Sons Forge & Machine Works 437
Gleason-Peters Air Pump Co. 458
Globe Jack Co. 496
Globe Optical Co. 495
Godshalk, E. H. & Co. 403
Goebel, F. A. 497
Goodrich, B. F. Co. 419
Goodson Electric Ignition Co. 459
Goodwin & Kintz Co. 504
Goodyear Tire & Rubber Co. 422
Graham Cycle Co. 599
Gray & Davis 547
Gray-Hawley Mfg. Co. 454
Great Western Mfg. Co. .... 70 & 71
Griffin & Bernhard 506
Grout Bros. Auto. Co. 62
H. M. & S. Armored Tire Co. 421
Halliday, C. A. 505
Ham, C. T. Mfg. Co. 323
Hansen, O. C. Mfg. Co. 475
Hardy, R. E. & Co. 426
Harley-Davidson Motor Co. 600
Harris, E. T. 602
Harris, A. W., Oil Co. .... 306 & 307
Hartford R. Works Co. 423
Hartford Suspension Co. 343
Hasbrouck Motor Works 399
Hatcher Auto. Parts Co. 500
Haws, Geo. A. 383
Hayes Mfg. Co. 331
Haynes Automobile Co. .... 41 & 41a
Heinze Electric Co. 424
Hendee Mfg. Co. 173
Herschell-Spillman Co. 466
Herz & Co. .... 38 & 38a
Hess-Bright Mfg. Co. 504
Hewitt Motor Car Co. .... 36 & 36a
Hildreth Motor Co. 405
Hill, Louis A. 498
Hill Mfg. Co. 503
Hine-Watt Mfg. Co. 217
Hisey-Wolf Machine Co. 501
Holley Bros. Co. .... 299 to 302
Holsman Automobile Co. 11
Hopson & Chapin Mfg. Co. 504
Houle, A. J. 407
Howe, F. D. 506
Hyatt Roller Bearing Co. 504
Hydraulic Oil Storage & Distributing Co. 537
Hyslop Body Co. 506
Ideal Carriage Washer Co. 498
Ideal Plating Co. 492
Illinois Auto. & Parts Co. 452 & 490
Imperial Brass Mfg. Co. .... 471 & 484
Imperial Porcelain Works 470
Imperial Wheel Co. 329
Induction Coil Co. 498
Iroquois Motor Car Co. 35a
Iriquois Iron Works 573
Jackson Auto. Co. .... 201 & 204
Jamesville Mfg. Co. 496
Janney, Steinmetz & Co. 581
Jeffery, Thos. B. & Co. 171
Jersey Brake Co. 367
Johnson Auto. Carriage Co. .. 85 to 88
Jones & Burt 496
Jones-Corbin Motor Co. 450
Jones Speedometer 430
Judd, W. B. 504
Judson, J. G. Co. 488
Kaltenbach, Fred. 496
Kasner, A. H. 488
Kellogg, E. H. 499
Kells, W. J. Mfg. Co. 492
Kelsey Co. 605
Keystone Law & Patents Co. 598
Keystone Spring Works 505
Kilgore Auto. Air Cushion Co. .. 305
King Mfg. Co. 416
Kinsey Mfg. Co. 569
Kirchberger, M. & Co. 215
Kirkham Motor Mfg. Co. 535
Knox Automobile Co. 157
Knox Motor Truck Co. 448
Kokomo Rubber Co. 254
Kowalsky, J., Engine Co. 407
Kroh, C. Z. & Co. 591
Lackawanna Leather Co. 483
Lackawanna Valveless Motor Co. .. 405
Lake Shore Engine Works 403
Lane Motor Vehicle Co. 479
Lear, Oscar, Automobile Co. 63
Leather Tire Goods Co. 280
Lehman, I. 591
Leng's, J. S. Sons & Co. 600
Light Mfg. & Fdry. Co. 289
Limousine Carriage Mfg. Co. 593
Link-Belt Engineering Co. 420
Lipman, C. E. 580
Lobee Pump & Machine Co. 461
Lock Switch Mfg. Co. 580
Locomobile Co. of America .. 14 & 15
Logan Construction Co. 183
Long Mfg. Co. 432
Loomis Auto Car Co. 440
Losier Motor Co. 53
Lunkenheimer Co. 317
M. & M. Mfg. Co. 472
McClellan, Charles P. 483
McCord & Co. 465
McGiehan Mfg. Co. 574
McKinnon Dash Co. 381
MacRae, H. C. 498
Madison-Kipp Lubricator Co. 586
Madison Square Garden Show 441
Manhattan Automobile School 506
Manhattan Storage Co. 325
Manufacturers' Foundry Co. .. 26 & 27
Manufacturers' Motor Car Co. 568
Manufacturers' Selling Co. 503
Manufacturers' Supplies Co. 275
Matheson Motor Car Co. 64
Maxwell-Briscoe M. Co. .... 65 to 68
Mayo Damper Co. 602
Mayo Radiator Co. 347
Mendenhall, C. S. 506
Merkel Motor Co. 195
Mesinger, H. & F. Mfg. Co. 585
Meyercord Co. 493
Mezgar, C. A. 575
Michigan Auto. Co. 504
Michigan Lubricator Co. 506
Michigan Top Co. 600
Midgley Mfg. Co. 600
Miller, Chas. E. .... 1 to 4
Miller, Chas. E., Anderson, Ind. .. 502
Miller's, Wm. P. Sons 498
Milwaukee Auto. En. & Sup. Co. .. 467
Milwaukee Motor Co. 591
Minn. Boat & Power Wks. 407
Mitchell, P. R. Co. (The) 506
Mitchell Motor Car Co. 231
Model Gas Engine Co. 129
Moline Auto. Co. 39a
Moon Motor Car Co. 53a
Moore Auto. Co. 572
More-Power Co. 497
Morgan, B. 434
Morgan & Wright 451
Morse Chain Co. 462
Morton, Robert E. 505
Mosler, A. R. & Co. 287
Mossberg, Frank Co. 490
Motor Car Equipment Co. 553
Motor Car Specialty Co. 565
Motor Car Supply Co. 490
Motor Cycle Equip. & Sup. Co. .. 602
Motor Directories Co. 506
Motor & Mfg. Works Co. 440
Motsinger Device Mfg. Co. 507
Mots Clincher Tire & Rubber Co. 420
Muncie Auto. Parts Co. 494
Muncie Wheel & Jobbing Co. 259
Murdock, James, Jr. 495
Mutty, L. J. Co. 416
Myers-Dayton Top Co. 503
Nathan Novelty Mfg. Co. 445
National Carbon Co. 427
National India Rubber Co. 475
National Motor Vehicle Co. 48 & 48a
National Oil Heating Co. 600
National Spring & Wire Co. 591
Neumeister, F. P. 405
Neustadt, J. H. Co. 499
Never-Miss Spark Plug Co. 468
New Departure Mfg. Co. 527
Newmastic Tire Co. 599
New Process Rawhide Co. 436
New Southern Hotel 458
New York Gear Works 474
N. Y. & N. J. Lub. Co. 455
N. Y. School of Auto. Engineering 506
N. Y. Sporting Goods Co. 333
Nicholls, W. T. 476
Nicholsburg, H. Mfg. Co. 498
Nock, Frederic S. 407
Nock, Geo. W. 443
Noonan, A. S. .... 410 & 411
Nordyke & Marmon Co. .... 12 & 13
Northern Mfg. Co. 49
Northwestern Stg. Battery Co. .. 426
Nungesser Electric Battery Co. .. [illegible]
Oakes & Dow Co. .... [illegible]
Ofeldt, August & Son .... [illegible]
Ofeldt, F. W. & Sons .... [illegible]
Ohio Carriage Co. .... [illegible]
Olds Gas Engine Wks. .... [illegible]
Olds Motor Works .... 151 to [illegible]
Oliver Mfg. Co. .... [illegible]
Orswell Ignition Co. .... [illegible]
Outdoors Co. 432
Pacific Tucking & Mfg. Co. .... [illegible]
Packard Electric Co. .... [illegible]
Packard Motor Car Co. .... [illegible]
Pantasote Co. 413
Parish & Bingham Co. .... [illegible]
Park City Brass Co. .... [illegible]
Parry, A. N. & Co. .... [illegible]
Pedersen, J. T. .... [illegible]
Penn Spring Works .... [illegible]
Penna. Rubber Co. .... [illegible]
Perfect Mfg. Co. .... [illegible]
Persons Mfg. Co. .... [illegible]
Phelps Quadrant Time Lock Co. [illegible]
Phila. Ornamental Wire Co. .... [illegible]
Phillips Motor Works .... [illegible]
Pierce, George N. Co. .... 16 & 17
Pignolet, L. M. .... [illegible]
Pioneer Brass Works .... [illegible]
Pittsburgh Hose Connector Co. .. [illegible]
Pittsfield Spark Coil Co. 571
Pontiac Knitting Co. .... [illegible]
Pope Mfg. Co. .... 32, [illegible] & 37
Portland Garage .... [illegible]
Post & Lester Co. .... [illegible]
Powell Mfg. Co. .... [illegible]
Premier Motor Mfg. Co. .. Back Cover
Pressed Steel Mfg. Co. .... [illegible]
Prest-O-Lite Gas Tank Co. .... [illegible]
Progressive Cy. & Auto. Sup. Co. [illegible]
Pungs-Finch Au. & Gas. En. Co. 461
Putnum, R. H. .... [illegible]
Railway Appliance Co. .... [illegible]
Rainier Co. .... [illegible]
Rajah Auto. Supply Co. 496
Rands Mfg. Co. .... [illegible]
Rapid Motor Vehicle Co. .... [illegible]
Reading Automobile Co. .... [illegible]
Reading Metal Body Co. .... [illegible]
Reading Sta. Cy. Mfg. Co. .. 72 & [illegible]
Reeves Pulley Co. .... [illegible]
Reeves & Son, Paul S. .... [illegible]
Regal Gasoline Engine Co. .... [illegible]
Reliance Mot. Car Co. Front Cover
Reliance Motor Cycle Co. .... [illegible]
Remy Electric Co. .... [illegible]
Reo Motor Car Co. 131
Richardson Engineering Co. .. 507 & 600
Riley, Wm. B. Co. 599
Riley-Klotz Mfg. Co. 579
Robert Instrument Co. 471
Roby, Sidney B. Co. 432
Roche, Wm., Dry Battery Co. 601
Rockwood Mfg. Co. 579
Rogers Mfg. Co. 488
Rollins Mfg. Co. 569
Rose Mfg. Co. .... 120 & 121
Ross & Kramer 601
Royal Battery Co. 236
Royal Equipment Co. .... 442 & 515
Royal Motor Car Co. .... 44 & 44a
Royal Battery Co. 236
Rubay, Leon 507
Rubber Tire Co. 508
St. John Rubber Tire Co. 421
St. Louis Motor Car Co. 506
Samson Leather Tire 508
Sandusky Foundry & Mch. Co. .. 591
Sartus Ball Bearing Co. 352
Scandinavian Fur & Leather Co. 599
Scheidig, John & Co. 495
Schoonmaker, A. O. 507
Schrader's Sons, A. 472
Schwarz Wheel Co. 315
Scoville & Peck Co. 433
Seaboard Air Line 519
Seaman, Willis F. 506
Seidler-Miner Electric Co. 461
Seitz, F. A. & Co. 601
Semi Dry Battery Co. 469
Seneca Falls Mfg. Co. 501
Shain, Charles D. 599
Shawver Co. (The) 486
Sheddan Mfg. Co. 563
Shelby Steel Tube Co. 494
Sherwood Mfg. Co. 457
Shipman, Ralph 508
Sibley & Pitman 469
Skinner & Skinner 471
Smith, Jos. N. & Co. 453
Smith, A. O. & Co. 479
Smith, D. B. & Co. 596
Smith & Mabley 133
Smith, R. H. Mfg. Co. 559
Smith & Williams 465
Soules Motor Car Co. 165
Spacke, F. W., Machine Co. 464
Speed Changing Pulley Co. .. 40 & 40a
Spicer Universal Joint Mfg. Co. .. 26
Splitdorf, C. F. .... 54 & 54a
Sprague & Carr 497
Sprague Umbrella Co. .... 43 & 43a

ADVERTISER'S INDEX—Continued

pringfield Au. Top & Uph. Co..503
pringfield Hat & Cap Co.........605
pringfield Metal Body Co.........417
tandard Carriage Lamp Co.......484
tandard Co. (The)...................443
tandard Connecting Rod Co.....474
tandard Gauge Mfg. Co..........501
tandard Roller Bearing Co..24 & 25
tandard Welding Co..............258
tanley, John T......................379
tar Ball Retainer Co..............602
tar Porcelain Co....................470
team Carriage Boiler Co..........600
teel Ball Co..........................303
tevens, J., Arms & Tool Co.....449
tevens & Co...............432 & 493
titch-in-Time Vulcanizer Co.....502
torage Battery Supply Co........507
tratford Hotel 458
treit, A. Machine Co..............466
udebaker Auto. Co.................. 46
upplementary Spiral Spring Co..496
vinehart Clincher Tire Co.,
Inside Back Cover
nnestvedt Machine Co............465
racuse Aluminum Bronze Co....285
racuse Gear Co.....................436
liaferro, W. T.......................496
eel, E. & Co..........................483
erry & Co..............................407
ermo Electric Co....................507
omas Auto-Bi. Co..................447
omas, E. R. Motor Co...241 to 244
ompson, Chas. A...................504
mes Square Automobile Co.,
431 & 597
mken R. B. Axle Co..............269
Tingley, O. O. & Co.................472
Tokheim Mfg. Co....................504
Toledo Metal Wheel Co............379
Tonkin Boiler Co.....................459
Toquet Motor Co......................399
Torbensen Motor Car Co...........450
Trageser, John, Steam Cop. Wks..591
Trebert Gas Engine Co.............414
Trebert Auto. & Mar. Motor Co..197
Tucker Wood Work Co.............500
Turner & Fish.........................209
Tuthill Spring Co.....................505
Twentieth Century Mfg. Co.......589
Ulery, W. J............................495
Ultra Pump & Power Co...........457
Uncas Specialty Co..................470
Underwood Typewriter Co.........490
Union City Body Co.................505
United Mfg. Co.......................407
Valentine & Co.......................495
Van Benschoten, John..............505
Vehicle Equipment Co..............465
Vehicle Specialty Co................476
Vesta Accumulator Co..............342
Voorhees Rubber Co................420
Wagner Motor Cycle Co............446
Walker, B. F..........................487
Walker, E. C. Co.....................438
Walker Motor Car Co...........261-264
Walter, N. C. & Sons...............495
Waltham Mfg. Co.............20 & 21
Warner Gear Co......................189
Warner Instrument Co..............309
Watkins, Frank M....................401
Way Muffler Co............290 & 291
Wayne Automobile Co......281 & 282
Weber Cycle & Supply Co.........499
Webster Mfg. Co.....................335
Weeber, O. J. Mfg. Co.............488
Weed Chain Tire Grip Co..........349
Welch Motor Car Co.................191
Westerfield Motor Co...............415
Western Malleable Steel Co.......473
Western Oil Pump Co...............605
Western Robe Co....................599
Western Tool Works.........56 & 57
Westinghouse Co. 459
Weston-Mott Co. 508
Wheeler, F. H.........................297
White, S. M. Co....................... 28
Whitlock Coil Pipe Co..............500
Whitney Mfg. Co.....................477
Widmayer, F. B.......................600
Wilhelm, H., Battery Co...........497
Wilkinson, A. J. & Co..............499
Willard Storage Battery Co........497
Williams, E. Q........................494
Willis, E. J. Co........................545
Wilson Auto. Clock Co..............506
Wilson, C. R., Body Co.............505
Windsor Automobile Co............ 29
Winkley Co. (The) 428
Winton Motor Carriage Co.........612
Witherbee Igniter Co................255
Wixon, H. H. & Co...................493
Wolverine Automobile & Commercial Vehicle Co.......................506
Wooster Co. 502
Worcester Pressed Steel Co.......473
Wray Pump & Register Co..42 & 42a
Young, Orlando W...................429
Youse, E. S.............................279
Zent, Automobile Co................506
Zorn, W. M............................507

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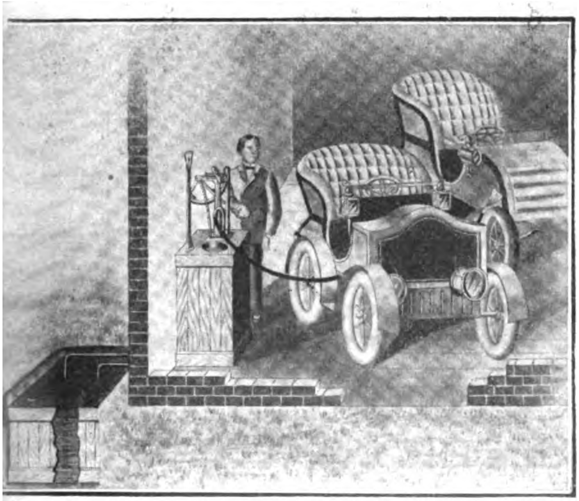

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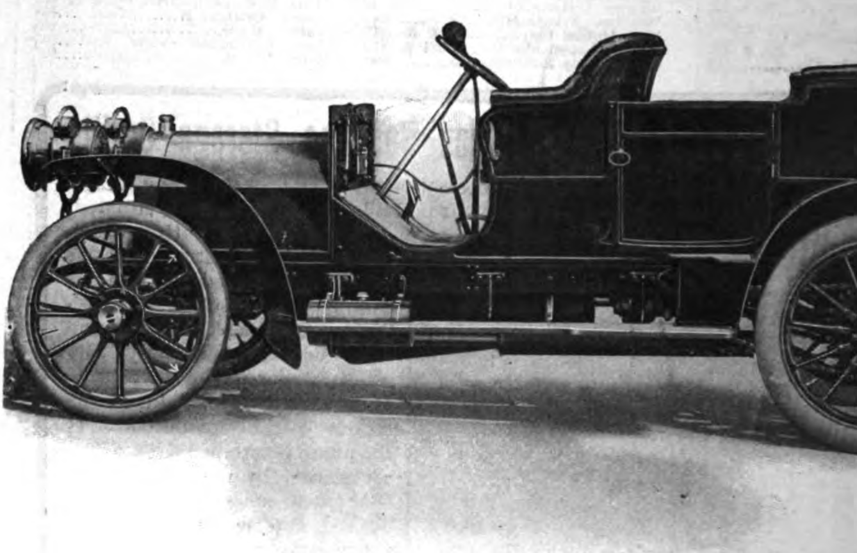

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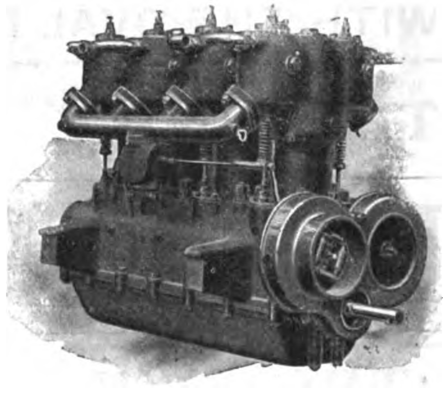

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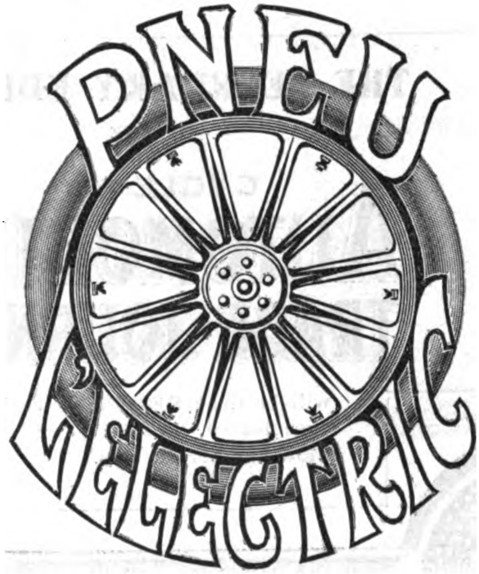

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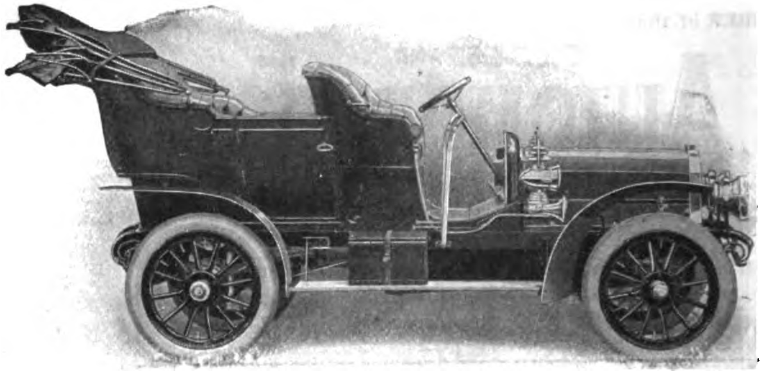

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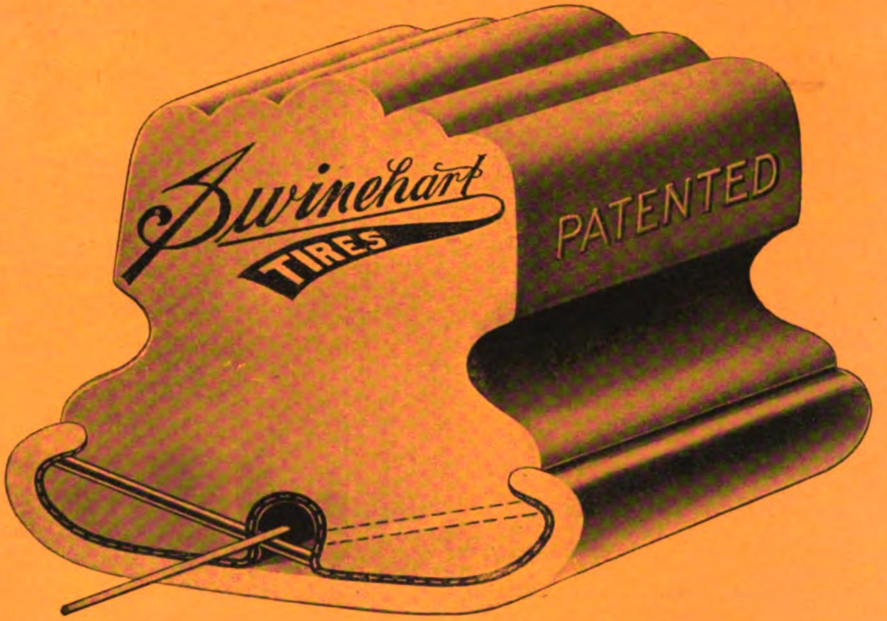

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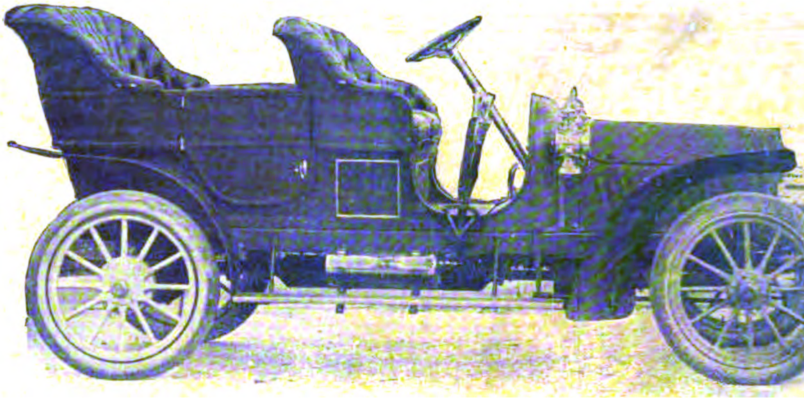

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